UNITED NATIONS

TD

United Nations Conference on Trade and Development

Distr.
GENERAL

TD/B/ITNC/AC.1/3
5 January 1995

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD

Intergovernmental Working Group of
Experts on International Standards
of Accounting and Reporting
Thirteenth session
Geneva, 13 March 1995
Item 3 of the provisional agenda

INCENTIVES AND DISINCENTIVES FOR THE ADOPTION OF SUSTAINABLE DEVELOPMENT BY TRANSNATIONAL CORPORATIONS

Report by the UNCTAD secretariat */

Summary

Sustainable development has become one of the most widely discussed topics in transnational corporations (TNCs), governmental bodies and academic institutions. However, sustainable development and commercial activity are often considered to be mutually exclusive. This report explores transnational corporations' reaction to this concept based on a survey about aspects of the nature of sustainability, what it means for the enterprise and its business activities, and the role that accounting can, and could, play in the pursuit of sustainability. The report also describes the factors behind the hypothesis of sustainability. In many instances, enterprise executives are not fully aware of the implications of environmental sustainability in the broader context. While a number of TNCs may wish to operate in a more environmentally friendly manner, financial pressure, contemporary markets and the traditional accounting model based upon historical costs are some of the factors which inhibit any substantial changes in TNCs' behaviour. The lack of understanding and formal guidance contribute significantly to the disparity. Furthermore, business-related research needs to be done in this area. Greater support from society as a whole can contribute to sustainable commercial activities.

*/ This report was prepared with the assistance of R.H. Gray and K.J. Bebbington of the University of Dundee, United Kingdom.

GE.95-50064

CONTENTS

		Paragraphs
I.	BACKGROUND TO THE STUDY	1 - 25
	A. Introduction	1 - 4
	B. The nature of sustainability	5 - 10
	C. The sustainable business?	11 - 18
	D. Accounting for sustainability? Accounting towards sustainability?	19 - 24
	E. Investigating the issues	25
II.	QUESTIONNAIRE RESULTS	26 - 50
	A. The nature of sustainability	27 - 34
	B. Influences on understanding sustainability	35 - 36
	C. Definition of sustainability	37
	D. Formal recognition of sustainability in the company	38
	E. Encouraging moves towards sustainability	39 - 41
	F. Activities which encourage moves towards sustainability	42 - 43
	G. Constraints on the pursuit of sustainability	44
	H. Accounting and financial systems issues	45 - 50
III.	CONCLUSIONS	51 - 52

Notes

I. BACKGROUND TO THE STUDY

A. Introduction

1. Perhaps the most important positive result to arise from the global environmental debate following the 1987 Brundtland Report[1] has been the almost universal acceptance of the goal of sustainability and sustainable development[2]. There has been an explosion of research into different aspects of sustainability and, at a more immediate level, nation States are producing sustainability plans, the European Union has set out its Fifth Action Programme entitled "Towards Sustainability"[3] and business, politicians, NGOs and local governments, among others, are all publicly recognizing the applicability of sustainability to their sector and areas of expertise.

2. What has not emerged, however, is a recognized consensus on what a sustainable global economy might look like, how we might get there and what implications this "path towards sustainability" might have for current ways of life. More especially, under the gloss of rhetoric, it is very unclear what business is doing, should do or, indeed, can do to re-direct economic activity towards more sustainable development.

3. This is a far from trivial issue. While it is clear that traditional economic activity and environmental degradation are closely linked, it is far from clear what degree of responsibility for this situation should be, or can be, laid on the shoulders of business. Global society has a right to expect business to do that at which it is most accomplished, i.e. to pursue traditional modes of efficiency, to seek market-led innovation and to respond rapidly and successfully to changes in the "playing field" -- changes in markets, prices, incentives, tastes and so on. It is not clear whether business can be expected to provide, on its own initiative, the innovative ways of thinking, the drastic re-design of life-styles, the costly structural re-adjustments and the major redistribution of wealth which are patently essential for a sustainable future. In this context, for example, the International Chamber of Commerce's (ICC) Charter for Sustainable Business[4] does not actually mention sustainability; and the influential analyses provided by, for example, The Business Council for Sustainable Development (BCSD) and The International Institute for Sustainable Development (IISD) offer absolutely no diagnosis of what sustainability actually might mean for business nor any assessment of how it might be achieved. What is offered in these documents, and correctly so from a business perspective, is a programme of actions which business can take which will be broadly sound economically and reduce the environmental impact of business activity. These actions can be effectively categorized as "pollution prevention pays" (PPP). The Environmental Management and Audit Systems (EMAS)[5] is a response to "green" consumers and the development of supplier chain audits. They have achieved considerable improvements in leading businesses. These steps must be further developed if environmental protection is to be effective. Indeed, such steps may very well be essential pre-requisites for any approach towards sustainability. However, such steps do not necessarily relate directly to sustainability and there is no reason why they might assure sustainability[6].

4. If we are to embark on the path towards sustainability and business is to play a major role in that journey, EMAS and related initiatives open the gate to that path. They represent little or no progress on the path itself. The reason for this lies in the nature of sustainability itself.

B. The nature of sustainability

5. Sustainability is an exceptionally difficult concept to define precisely[7]. The general definition of sustainability which is most widely accepted is that provided by the Brundtland Report and refers to development which:

> "...meets the needs of the present without compromising the ability of future generations to meet their own needs"[8]

While this proves to be a very good starting point, it is far too general a definition to be practicable. Indeed, its very generality has probably been the reason why the definition is so widely accepted[9]. However, it is proving increasingly possible to define elements of sustainability in a way which is both practicable and recognizably in harmony with the general definition. Two widely accepted and usefully defined elements of sustainability were employed in this study and these are outlined here.

6. First, sustainability is not only an environmental issue, it is also a social issue. That is, sustainability has essentially two closely related components which one can refer to as "eco-efficiency" and "eco-justice". The first refers to the issues of the physical environment and mankind's use of it, the second to the issues of inter- and intra-generational equity which are essentially social issues[10]. Whilst by far the greatest attention has been paid to the eco-efficiency concerns -- especially so in the business context -- the path towards sustainability must, by definition, involve some advancement in eco-justice issues.

7. Second, environmental economists have successfully provided a useful and practicable articulation of a number of the essential parameters of eco-efficiency and the inter-generational (but not intra-generational) equity/eco-justice issues[11]. First, we might usefully think of the planet and mankind's interaction with it as involving two kinds of things which we can call "Natural Capital" and "Man-made (or Created) Capital". The natural capital comprises the planet's resources (including eco-systems and waste-sink capacities) whilst man-made capital such as buildings, roads, knowledge, machines and consumer goods, which mankind has "created" from its own efforts employing the resources of the planet. There are two points to note here: (a) in general terms, most of the man-made capital is created at the expense of the natural capital so that as man-made capital rises, natural capital must fall; (b) in general terms, man-made capital is recognised by economic systems (and by accounting systems, see below) in prices whilst natural capital is not recognised. Much of the natural capital will therefore be treated as a free good and its decline will not register in measures of economic success such as GNP or accounting profit.

8. Furthermore, natural capital can be thought of as comprising two sub-categories: critical natural capital and renewable, replaceable or substitutable (or other) natural capital. The critical natural capital is that essential to the maintenance of life[12] and comprises the integrity of eco-systems, issues such as the maintenance of the ozone layer and protection of species which are close to levels of self-sustenance. Other natural capital is that which can be renewed (e.g. species through breeding or relocation of sensitive eco-systems), repaired (e.g. reclamation of desert or replanting of forests) or substituted or replaced (e.g. use of man-made substitutes for natural resources such as solar panels for fossil fuels).

9. A sustainable economic system is one which explicitly protects all critical capital, renews some elements of other natural capital and/or employs additions to man-made capital to substitute for depletions in other areas of natural capital. In addition, a sustainable economy would also address the massive inequities between races -- most obviously the North-South inequality -- in recognition of the intra-generational equity demand of sustainability. It is perfectly clear that no economic system (certainly no "developed" economic system) is currently sustainable under this analysis[13]. The question which then arises is "how large is the gap between current practice and the desired state of sustainability?".

10. It is probably impossible to answer this question accurately but that may not be important. For example, it is possible to undertake calculations to estimate the sort of expenditure that an economic system would have to bear in order to prevent further degradation of critical and non-substitutable natural capital and, then, to make further estimations of the expenditure necessary to move that "steady state" back to more sustainable levels of activity. Even under

the most conservative of estimates, these expenditures are so large as to have massive impacts on western levels of physical consumption. Indeed, Hueting and Ekins (see endnote 11) have argued that we should talk in terms of more or less un-sustainable activities in order to avoid detailed concerns about what sustainability really looks like. We know we are moving towards greater and greater levels of un-sustainability. The first task is therefore to start to reduce that un-sustainability. This will be massively expensive and disruptive. Furthermore, this is without addressing thorny matters of eco-justice and more equitable distributions of consumption, wealth and environmental impact.

C. The sustainable business?

11. If business is to be part of the process of re-directing economic activity away from increasing un-sustainability then it may be useful to assess whether business can be sustainable under present economic arrangements. And if so, how? It follows from the above analysis that, at a minimum, a sustainable business is one which leaves the environment no worse off at the end of each accounting period than it was at the beginning of that accounting period. For full sustainability, the sustainable business would also re-dress some of the excesses of current un-sustainability and consider the intra-generational inequalities. It is perfectly clear that few, if any, businesses, especially in the developed economies, come anywhere near to anything that looks remotely like sustainability.

12. Environmentally aware companies have stated within their publications opinions such as:

> "... very few businesses can be said to be sustainable in their operations, since in one form or another their activities consume non-renewable resources, whether directly through travel or their use of raw materials or indirectly through their use of energy."
> (IBM UK, Progress Report, 1993, p.38)

> "We challenge the notion that any business can ever be 'environmentally friendly'. This is just not possible. All businesses involve some environmental damage. The best we can do is clear up our own mess while searching hard for ways to reduce our impact on the environment."
> (Body Shop, Green Book, 1992)

> "Few, if any, businesses could claim to be anywhere near this position [of sustainable development] at present, but a number, including BT, have begun to consider what it might mean."
> (British Telecom, Environmental Performance Report, 1993, p.35)

> "I strongly believe that economic development and environmental protection should be pursued as mutual goals, but I have real doubts about the extent to which any company can manage its operations on a truly sustainable basis."
> (Thorn EMI Environmental Report, 1994, p.4)

> "At first sight the concept of sustainable development seems straightforward. But if its implications are examined, it becomes clear that a fundamental rethinking of attitudes towards production and consumption is required on the part of companies, society and the individual."
> (Ciba Geigy Ltd, Corporate Environmental Report, 1992, p.14)

13. These statements contrast markedly with the casual use of the term "sustainable" which one will find in the environmental reports of a number of transnational corporations (TNCs) which assert to such matters as their "sustainable forestry policies", or "sustainable use of resources" or the "pursuit of sustainable resource use through constant improvement in efficiency" and so on. These are not statements about sustainability and mis-use through mis-

understanding, an important and seriously challenging concept.

14. A particularly clear case for the un-sustainability of business is expressed by Dr. Chris Dutilh of Van den Bergh (Unilever) Netherlands. Dr. Dutilh illustrates the case by reference to two diagrams -- shown here as Figures 1 and 2.

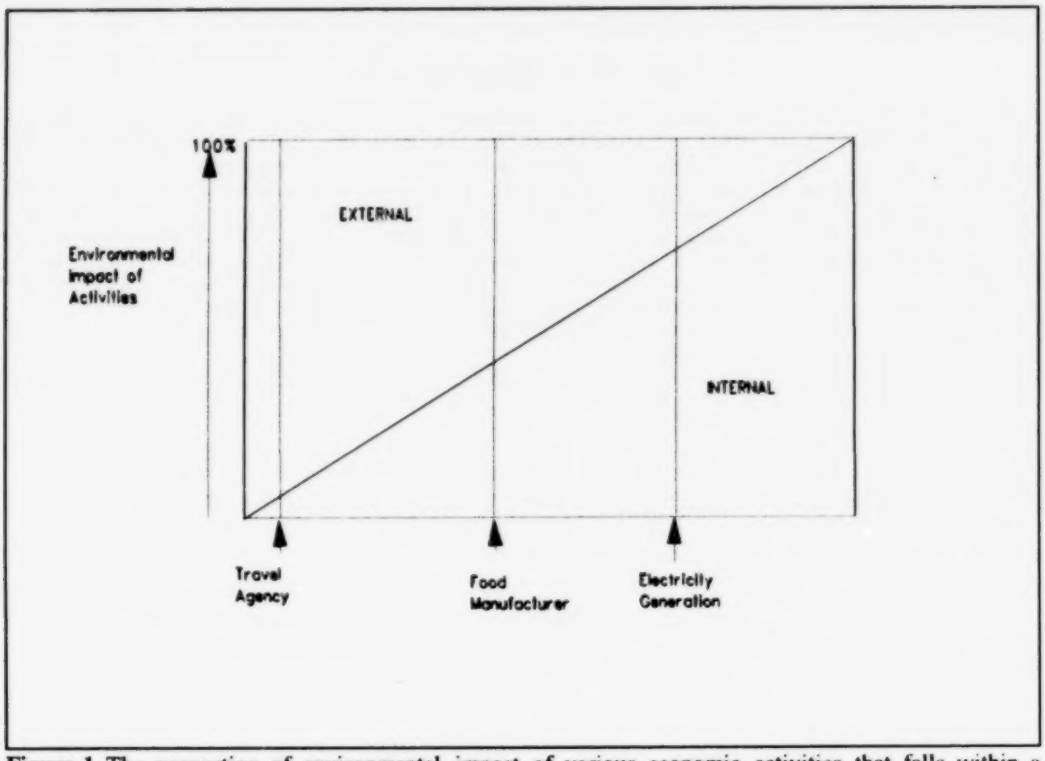

Figure 1 The proportion of environmental impact of various economic activities that falls within a company's control. (With acknowledgement to Dr Chris Dutilh).

15. Figure 1 attempts to recognise the full environmental impact of different economic/business activities. (This full impact could equally well cover eco-justice issues as well). Some proportion of the environmental impact is under the control of the company or industry concerned (for example, the use of energy) whilst some of the impact is (currently at least) outside the business' control (for example, supplier, customer and disposal aspects). The proportion which is within or without the business' control obviously varies considerably between economic activities. Three possible examples of these are shown along the bottom of Figure 1. For example, a travel agent will have very little direct impact on the environment although the activity of tourism itself has a massive impact through the activities of operators. On the other hand, food manufacturing has a major impact within the company's control but there is still a considerable degree of impact represented by the activities of (for example) agricultural suppliers and the actions and lifestyles of consumers. Finally, electricity generation incurs most of its environmental impact on the site of generation and a lesser impact is outside the company's control in the form of, for example, supply of the fuel[14]. Any company, by itself, can control only a small proportion of the total impact. This is shown in Figure 2. The company can manage through EMAS-related control and innovation a substantial minority of the overall

environmental impact of its activity. This proportion is greater, the greater the proportion of the total impact that lies within the company's control. The motivation for these EMAS-related controls and innovations will, on the whole, be economic -- of the "pollution prevention pays" variety. Further reductions in environmental impact are possible through supply-chain initiatives and through educating the consumer of the product. However, together these two initiatives can still only reduce a relatively small proportion of the activities' overall environmental impact. The rest of the impact lies outside the control of the company. In particular, it lies in the hands of governments, individual employees, individual consumers, overall lifestyles and, at a societal level, general aspirations and expectations.

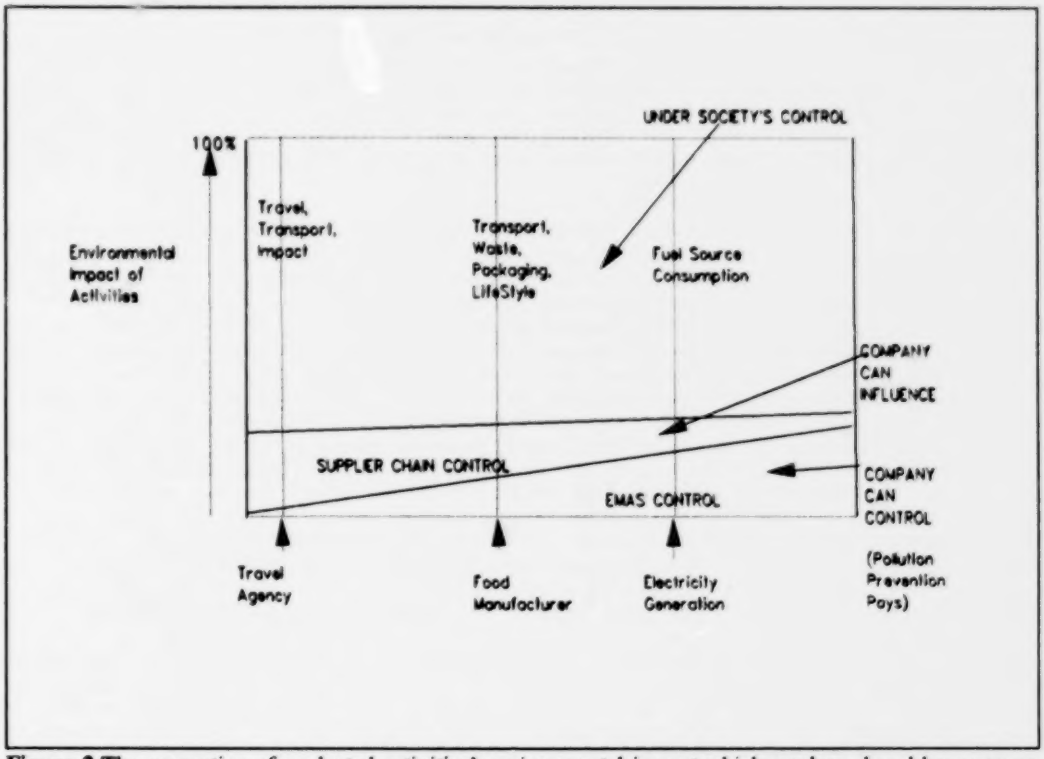

Figure 2 The proportion of a selected activities' environmental impact which can be reduced by company action. (With acknowledgement to Dr Chris Dutilh).

16. There is, probably, a further layer of influence that could be added to Figure 2. This would relate to the company's own influence on consumption patterns and tastes through activities such as advertising, style-changes and lobbying. However, many companies argue that no single company can pull back from, for example, encouraging people to consume its products as this will probably leave the company at a major economic disadvantage *vis-a-vis* other companies in the industry. This issue, most companies would argue, is also a case for society to decide. Society must set the terms for business. Business will respond.

17. Taken from this perspective, then it is wholly unreasonable for society to expect business to become sustainable under its own initiatives. If economic systems are to move towards sustainability, then the "rules of the game" will have

to change. How much influence companies have on that process is largely a question of one's perspective. It is perfectly clear that business is not, and cannot be, sustainable under present economic conditions. The issue to be investigated is not, therefore, with business sustainability, *per se*, but the steps that companies are taking to reduce their un-sustainability and the extent to which they are aware of the problems that the path towards sustainability is placing in their way.

18. It is in this context that accounting has several important roles to play.

D. Accounting for sustainability? Accounting towards sustainability?

19. Accounting in its broadest sense[15] can play, and does play, a number of roles in the company's pursuit of sustainability. Some of these roles are positive (in the sense of encouraging the corporation to move towards less-unsustainable actions) whilst others may be negative (in the sense of sending signals which encourage environmentally-malign behaviour and in offering resistance to new initiatives designed to encourage more socially and environmentally sensitive behaviour).

20. The negative roles that accounting can play have been widely described[16]. Broadly speaking conventional accounting and finance can hold back the pursuit of eco-efficiency through means such as: restrictive budgeting practices; short-term profit-centred performance measurement; overly restrictive capital budgeting and new product decision-making; encouraging stockmarket focus on bottom-line profit and measures such as earnings-per-share; and, perhaps most importantly, through its influence on the way in which organisations and organisational success are constructed through measurable forms of control which may well be in conflict with a wider, values-centred approach to organisational management, (see below). Similarly, accounting and finance can play malign roles in the pursuit of eco-justice. Some of the most obvious of these arise from international transfer pricing as a mechanism for reducing host country control of multi-national corporations and from the emphasis that conventional accounting inevitably places on shareholder returns at the expense of other stakeholders[17]. Thus, issues of plant closures, relocation, wage bargaining, directors' remuneration, take-overs and mergers all have implications for the distribution of wealth both within developed economies and between developed and under-developed economies.

21. On the other hand, accounting can play a very positive role in helping companies develop environmentally and socially sensitive policies. To date these positive roles have tended to be less developed than the negative roles, but increasingly companies (and accountants) are recognising how accounting and financial systems can be employed in innovative ways. These are broadly summarised in Figure 3.

22. However, there is one final point to stress before turning to look at the data collected. It is not necessarily the case that accounting and financial systems play an all-embracing role in an organisation. Indeed, it is quite possible that an organisation serious about sustainability would take every step to reduce the influence of the conventional accounting and financial systems. One way of recognising this is shown in Figure 4. Most traditional and large companies will probably be "performance-centred" with an active accounting system. In some, the accounting and financial systems will be more passive, responding and reactive rather than proactive. Whilst the financial systems will record "success/failure", the targets, objectives, goals, and missions of the company are likely to be expressed more in terms of growth, market share and quality statements. In others, the accounting and financial systems will be active, providing the direction for the organisation. In these organisations the targets, goals and missions will be expressed in financial terms. Thus, for example, maintenance and increase of earnings per share may well be the goal of the organisation and all performance expressed in terms related to it. Such companies may be recognised, also, by an appetite for profit-rich acquisitions.

FIGURE 3: ROLES OF ACCOUNTING IN THE PURSUIT OF SUSTAINABILITY

STAGES OF ORGANIZATIONAL DEVELOPMENT	ECO-EFFICIENCY ISSUES	ECO-JUSTICE ISSUES
Improvement within current economic orthodoxy (Reducing un-sustainability):	* EMAS accounting - for wastes, efficiency, energy, pollution, etc. ("Pollution Prevention Pays"); * Reworking investment appraisal methods; * Contingent liabilities, asset revaluation and other financial reporting issues; * Tellus Institute methodology; * Basic environmental reporting.	* Employee and employment reporting, information for collective bargaining; * Value-added statements; * Bilan Social; * Community reporting; * Stakeholder analysis.
Recognition of the demands of sustainability	* Sustainable cost calculation and reporting; * Full cost accounting (EU 5th Action Plan); * Advanced environmental and sustainability reporting (including LCA and oköbilanz) - accountability and transparency.	* Full social reporting and social bookkeeping systems; * External social audits; * Transparency on transfer pricing and resource acquisition issues; * Accountability and transparency

FIGURE 4: ROLE OF ACCOUNTING IN THE COMPANY'S ENVIRONMENTAL RESPONSE		
	TYPE OF COMPANY	
TYPE OF ACCOUNTING SYSTEM	Performance-Centred (Accounting often dominant)	Values-Centred (Accounting less important)
Accounting System Passive	Driven by stock market, profit, financial performance appraisal	Other mechanisms used to identify financial efficiency - if at all
Accounting System Active	Methods of accounting explicitly linked to company's goals	Actively part of management process - BUT very constrained

23. Values-centred companies are, base upon experience, rather more rare. But companies such as Body Shop (UK), Traidcraft (UK) and Ecover (Belgium) are values-centred companies with passive accounting systems. They are characterised, very often, by a protected or unusually sensitive shareholding structure that prevents the company from predatory action in the stockmarkets. Whilst it is difficult to be certain, the actions of Ben and Jerry's (United States) -- a company widely recognised as values-centred -- appears to have an active accounting and financial system in that the development and expansion policy of the company appears to be tightly controlled in financial terms but, on the surface at least, the financial systems appear to be integrated with, and subservient to, the company values[18].

24. The outcome of these differences means that, in the values-centred company any development of the accounting and financial systems to encourage more environmentally and socially-sensitive behaviour may well be counter-productive. The values of the company will drive behaviour in these directions and the accounting systems will simply follow as required. On the other hand, in the performance-centred companies, it is highly unlikely that much progress can be made on either the eco-efficiency or eco-justice fronts without the developed support of refined and improved accounting and financial systems.

E. Investigating the issues

25. These were the background issues which informed and determined (a) the way in which the questionnaire was developed and subsequently used and (b) both the selection procedure for companies which form the case-studies and the way in which discussions were held in the companies. It is in the context set out above that the results are interpreted and, as shall become apparent, certain of the responses in the questionnaires might have led to alternative interpretations if the analysis started from a different point of view. As with all data, the researchers' orientation as described above should be noted when drawing conclusions. (More details on the method and mechanisms of the research are given in Appendix A, which is a separate document and is available only in the English language.)

II. QUESTIONNAIRE RESULTS

26. Although questionnaires were received from companies in different countries, from different industry sectors and of a variety of sizes[19] there was notable commonality of views about aspects of the nature of sustainability, what it meant for the business and the role that accounting can, and could, play in the pursuit

of sustainability. This section reviews these results and follows the structure of the questionnaire itself (see Appendix B which is also a separate document and available only in the English language).

A. The nature of sustainability

27. Respondents were offered a range of statements concerning the nature and implementation of sustainability in business and were asked to indicate their agreement or disagreement with these[20]. There were 8 of these statements with which 75 per cent or more of the respondents could agree. These are shown, with the percentage agreeing, in Figure 5.

FIGURE 5: VIEWS ON THE NATURE OF SUSTAINABILITY

Business' pursuit of sustainable development.....	Percentage agreeing with the statement
..requires a partnership approach from government, business and society	96
..means tackling both social and environmental problems	86
..requires balancing the needs of the economy with environmental protection	86
.. is compatible with the profit ethic	82
..will involve all parts of society in discussion and implementation	82
..involves fundamental changes in attitudes and values	82
..is possible	78
..is likely to be complex and require extensive changes	75

28. Respondents also seemed to be in broad agreement on the compatibility of sustainability with economic growth (67 per cent) and that businesses' pursuit of sustainable development involved: consideration for people of developing countries (74 per cent); commitment from the financial markets (70 per cent); and, concern for wealth distribution between nations (66 per cent).

29. On the other hand, there was also evidence that business (as a whole) does not hold a single, clear interpretation of sustainability. Two factors point to this. First, more than one quarter of the respondents were undecided about issues such as: the role of environmental management systems; the role of accounting systems; the magnitude of the costs involved; the compatibility of sustainability with economic growth; and, the extent to which sustainability was currently achieved in the respondent's business. This indecision is important because it highlights that a number of organisations lack direction in their search for a sustainable path. Second, and far more persuasive, is the number of companies which believe: that sustainability does not involve the needs of future generations (59 per cent); that sustainability is synonymous with environmental management systems (45 per cent); and that their organisation already achieves sustainability (37 per cent). Such beliefs seem completely at variance with the most basic and commonly accepted parameters of sustainability.

30. The essence of the enquiry in this question concerned three basic issues or groups of issues: (a) did companies see sustainability as compatible with the

status quo?; (b) did companies appreciate the eco-justice as well as the eco-efficiency issues?; and, (c) did companies appreciate the difficulty of the challenge set by the concept?

31. If sustainability is compatible with the status quo it will be "achievable", compatible with profitability and compatible with economic growth. Forty-one percent of the companies agreed that sustainability was all three. This is shown in Figure 6 as seeing sustainability as "compatible with the status quo". On the other hand, no companies saw sustainability as it is usually typified in the literature as being exceptionally difficult, incompatible with both economic growth and the profit ethic and probably involving something other than a "balance" between economy and the environment. Most companies (59 per cent) gave mixed responses to these questions.

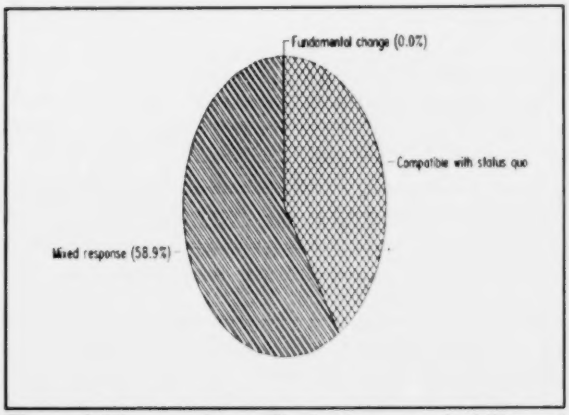

Figure 6: Views on the conflict between sustainability and economic criteria

32. Secondly, if companies recognised the importance of the eco-justice issues then, within question 1 they could be expected to agree broadly with questions relating to partnership issues, accountability and transparency, future generations, wealth distribution and third world issues. The proportion of companies subscribing to these views is shown in Figure 7. The majority of companies display a consistently positive attitude to those aspects we have labelled "strong" eco-justice. That is, they appear to be highly aware of and supportive of the social requirements of sustainability. On the other hand, very few companies expressed views entirely at variance with a recognition of the eco-justice point of view. (This 1.4 per cent is shown as "weak eco-justice" in Figure 7). Nearly half of the respondents (45 per cent) gave a mixed response on this issue.

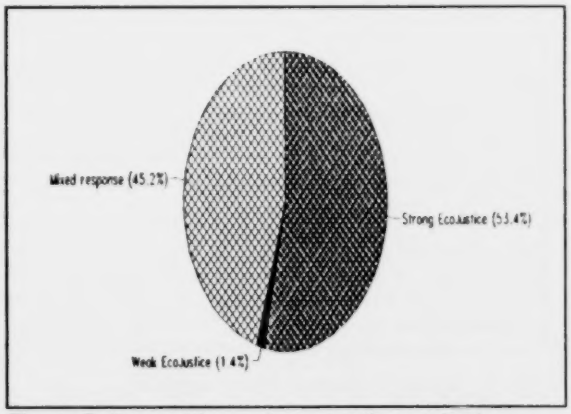

Figure 7: Recognition and support for eco-justice

33. Finally, a company which had a good grasp of sustainability would appreciate that the path towards sustainability would involve changes in attitudes and values, would be complex and probably costly. The 37 per cent of companies subscribing to this view are shown in Figure 8 as recognising that a "complex readjustment" is needed. No companies expressed views that indicated the transition would be entirely straightforward ("simple readjustment"). The majority of companies had a mixed response to the issues.

34. It is difficult to draw clear conclusions from this question. However, the data suggests that although there are signs of a lack of sophistication in companies' understanding of the implications of sustainability, respondents do appear to recognise that eco-justice issues are relevant and also to recognise that the path towards sustainability is likely to be complex.

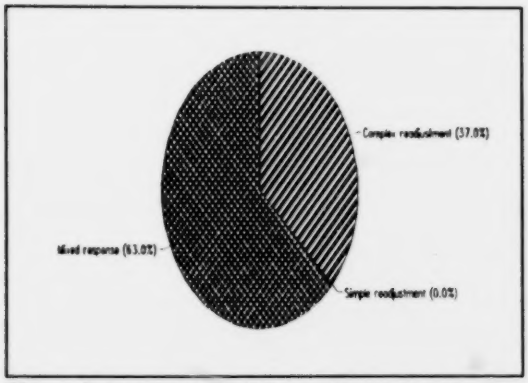

Figure 8: Recognition of the readjustment necessary for sustainability

B. Influences on understanding sustainability

35. The sources of respondents' understanding of the concept are important because sustainability is both a difficult and emerging concept. Different sources give different insights into the issues and emphasise different aspects of how to move towards sustainability. Furthermore, knowledge about the sources that companies consult may have implications for those bodies who are seeking to help business develop its posture of response to the issue of sustainability. Over 70 per cent of respondents were influenced by, *inter alia*, the ICC, Agenda 21 and the Rio Summit, their own company, books and economic journal articles, the media, the Brundtland Report, their national government and professional or trade associations. Of these, easily the most influential were the first four. The BCSD, the EU's Fifth Action Programme[21], environmental pressure groups, the World Conservation Strategy and other non-governmental organizations (NGOs) were the least influential sources of understanding.

36. Some inference may be drawn from this. The influence of the respondent's own company is not unexpected but, given that the questionnaire was completed by the member of that company who understood the issues best, the influence is confusing. That is, (a) there is no *a priori* reason why a company should have a sophisticated understanding of the issue; and (b) if anybody within the company did understand the issue it would be the person completing the questionnaire. It is likely therefore, that the influence of the company was concerned with whether or not initiatives towards sustainability could be taken -- rather than an influence on the understanding itself. Agenda 21 would not have provided much direct guidance to a company seeking sustainability but, clearly, raised the issue to a significant degree in the global context. Its influence seems, again, to be one of awareness and changes of the political agenda for the environmental management team. So the principal influences on understanding are the respondents own self-education through books and journals and the ICC. It was expected that the influence of the ICC (and, less correctly, the BCSD) would be high. The fact that the ICC does not actually address sustainability goes some way towards explaining what look like naïve understandings of the concept amongst many of the respondent businesses.

C. Definition of sustainability

37. Commentators have argued[22] that the very general nature of the definition of sustainability has been instrumental in permitting widespread agreement about its desirability. A more specific definition might raise conflicts over, *inter*

alia, issues of redistribution of wealth and challenges to existing western patterns of development and consumption. And yet previous work[23] has identified that companies need specific guidance on the implications of the term if they are to address the issue directly. Over 60 per cent of respondents said they favoured a more specific definition of the term. Later questions also addressed this issue and a substantial minority of respondents (36 per cent) suggested that the lack of precise definition was a real constraint on their moves towards achievement of sustainability. It is not clear to what extent companies who recognise the need for more precision in the application of the term appreciate the implications this may have for current economic orthodoxy. For example, it is apparent that some of the best-informed respondents did not want a specific definition of the term because they did appreciate its potential implications for business practices whereas some of the least-informed wanted a less-general definition simply because they did not appreciate the extent to which the pursuit of sustainability involved far more than sophisticated EMAS. If we believe that development of EMAS is a useful step towards sustainability then a more specific definition may be premature. On the other hand, the implications of the term require very careful debate and examination and this may be a matter that policy-making bodies should be addressing at as early a stage as possible. In the absence of a specific definition, sustainability may be becoming a "motherhood" term whose parameters are left in the hands of industry groupings such as a nation's confederations of business, the ICC and the BCSD. This is certainly practicable in the short term. It may not be effectual in the long term.

D. Formal recognition of sustainability in the company

38. Eighty-two percent of respondents said that their company formally recognised sustainability. Ironically, the majority of these "formal recognitions" did not explicitly cite sustainability or definitions of sustainability. There was, on the whole, recognition of the environmental agenda within policy statements as well as recognition of the need for development of EMAS and related initiatives. In less than 20 per cent of cases could some explicit recognition of the term be offered as evidence of the formal recognition by the company. This, again, suggests that a high proportion of companies have yet to appreciate that general environmental policy statements coupled with EMAS does not guarantee sustainability. This was recognised by the majority of the companies which replied that their organisation did not formally consider sustainability. Eleven percent of respondents described their (significant) steps towards environmental management but explicitly recognised that these are not necessarily sufficient for a formal recognition of sustainability. One of the very few clear country exceptions was apparent here. Half of the Dutch companies clearly understood sustainability but clearly recognised that their advancement of EMAS did not guarantee its achievement.

E. Encouraging moves towards sustainability

39. Easily the biggest influences on respondents in "their moving towards sustainability" were the laws (actual and impending) and market opportunities. Over 86 per cent and 90 per cent of companies, respectively, cited these influences. This more than anything, illustrates the potential confusion over the meanings of the term "sustainability". Whilst the term has now crept into some areas of some national laws, there is no evidence that current or immediately impending laws actually addresses the structural changes that sustainability will require. Furthermore, there are remarkably few market opportunities which can be demonstrated to be commercially attractive and inherently sustainable. What we know from elsewhere[24] is that these influences are significant in encouraging companies on the path towards better environmental stewardship and management. Similarly, the third and fourth sources of encouragement -- the company's national government (79 per cent) and employees (74 per cent) -- have been widely recognised as important influences on a company's environmental response. Other sources of encouragement towards sustainability included the European Union (70 per cent), industry associations (64 per cent)[25], customers (64 per cent), NGOs (58 per cent) and pressure groups (51 per cent).

40. The increasing doubt which the questionnaires engendered as to whether or not most companies appreciated the full implications of sustainability were further reinforced by this question. That is, very few companies identified any of the sources as discouraging moves towards sustainability. This is clearly incorrect.

41. This was also the first stage at which accounting and financial systems entered the enquiry. Whilst a substantial proportion of respondents considered that capital markets (49 per cent), the financial accounting system (67 per cent) and financial institutions (73 per cent) played no part in encouraging or discouraging moves towards sustainability, these three were the principal sources identified by companies as discouraging sustainability. (See also part G below). Eight percent believed that capital markets and financial institutions discouraged them, whilst 14 per cent identified the financial accounting system as a major discouragement of any moves towards sustainability.

F. Activities which encourage moves towards sustainability

42. Respondents were offered a range of activities and asked to identify which might move their organisation towards sustainability. Figure 9 summarises some of the results from this question[26]. In broad terms, companies, as expected, are generally well-informed about eco-efficiency and environmental management issues. The level of activity in these areas, whilst no cause for complacency, is also broadly in line with other surveys.

43. Companies are less enthusiastic about accountability and transparency issues. But even here, there is something approaching agreement on the importance of openness. Notably, redesign of the accounting system was the area, companies considered, that would contribute least to the pursuit of sustainability. More significantly still, it was the two specifically accounting-related areas of investment decisions and developments of accounting systems on which companies were least sure on how to proceed. This seems to point to a need for wider dissemination of proposals and further practical research work into the issues.

G. Constraints on the pursuit of sustainability

44. Whilst 16 per cent of respondents replied that sustainability was unimportant to the organisation and 23 per cent suggested that there was no demand for the company to pursue the concept, most companies which identified constraints saw the principal constraints they face as comprising: a lack of guidance (47 per cent), clear definition (36 per cent) and support (53 per cent); a problem of priorities (51 per cent); and accounting-related problems (47 per cent). Probably most importantly, however, company views on the issue of constraints were widely dispersed. There is no unanimity on this issue. Virtually half of the respondents saw few, if any, constraints on their capacity to pursue sustainability. Those who did see constraints wanted further government support and guidance and/or saw that current measures of success (e.g. growth and profit) and the present system of accounting as their principal impediment[27]. At this stage it is not possible to determine possible explanations of why these differences in views arise. At least part of it, we infer, is related to the understanding of sustainability but there are likely to be other issues that will require further analysis to isolate. There would certainly appear to be policy-implications in even these initial findings.

H. Accounting and financial systems issues

45. As might have been expected, accounting and finance have not appeared as central issues in companies' responses about sustainability. Most companies have not seen profit or the capital markets as either major problems or potential sources of conflict. As a result, it is no surprise to discover that accounting is one of the least developed areas of companies' response to the sustainability agenda. And yet, accounting is clearly an area on which a substantial minority of companies need further guidance and where significant future developments and

problems may emerge. It was central to this project to try and investigate these matters further.

46. Figure 10 summarises the dominance of the accounting system in company management. The diversity of views amongst company respondents is again apparent in this figure. While a majority of companies are accounting-dominated in traditional areas of decision-making, practice varies considerably in other areas -- especially those related to social and environmental matters. This diversity of experience may be part of an explanation as to why respondents were less unanimous on the role of accounting in the pursuit of sustainability -- in less accounting-dominated, more values-centred organisations, management may well look to other measures to appraise and assess options without keeping one eye firmly on the "bottom line". This, again, deserves further investigation.

47. Which brings us to two of the central questions which this research sought to answer -- "what innovative accounting methods are being used by companies?" and "why?". The results are not especially encouraging at this stage of development. Only a minority of respondents are familiar with a number of the accounting options devised to help a company assess its path towards sustainability. A further minority is actually experimenting with these options. If accounting-related techniques do have a role to play in helping companies redirect their activities -- and it seems increasingly certain that they do -- more effort needs to be exerted in disseminating these proposals and encouraging companies to experiment with them. Other evidence suggests that both LCA and mass-balance/oköbilanz techniques have real practical benefit for the companies themselves as well as highlighting the real issues facing a company considering addressing sustainability seriously. Other methods are less widely applied in practice as yet but deserve practical experimentation -- if only to either reject them or develop ways around their practical problems. There is clearly a need for more education of companies in this area.

FIGURE 9: IMPORTANCE OF SELECTED ACTIVITIES ON MOVES TOWARDS SUSTAINABILITY

	Percentage of Companies Responding			
	Will contribute towards sustain-ability	Will not contribute towards sustain-ability	Company is active in the area	Company not sure how to proceed
Reduction in energy usage	96	1	74	0
Reduction in the consumption of resources	96	1	67	0
Reduction in the volume and toxicity of wastes	85	3	67	1
Targets for moving towards sustainability	84	3	48	8
Recycling	82	4	68	3
Commitment to an environmental management and audit system	81	7	66	4
Use of social and environmental criteria in capital budgeting and investment decisions	74	5	40	21
Reporting on the achievement of sustainable development targets	74	4	48	8
Product design to increase the life of the product and improve reparability	74	11	41	10
Providing information to share-holders and financial community on your social and environmental impact	67	4	55	10
Policy statements regarding the pursuit of sustainable development	64	10	56	3
Being open to scrutiny by groups and individuals outside of the organisation	56	15	47	4
Redesigning the accounting system -e.g. for full cost accounting or for environmental provisions	51	14	19	23

FIGURE 10: ACCOUNTING'S DOMINANCE IN COMPANY DECISION-MAKING				
	Percentage of companies who indicated that accounting and finance systems and criteria			
	..dominate organizational decisions	..are just one set of criteria	..are dominated by other criteria	No response
Medium and short term planning	78	15	5	2
Capital expenditure and investment	75	18	5	2
Divisional performance evaluation	71	22	5	2
Corporate strategy	59	34	5	2
Managerial performance evaluation	52	36	10	2
Relationships with the financial community	51	32	16	1
Purchasing decisions	47	45	7	1
Make or buy decisions	41	48	7	4
Remuneration of senior executives	33	40	25	2
Environmental projects	30	42	26	2
Environmental standards and targets	27	37	34	2
Research and development initiatives	26	41	32	1
Staff training	22	49	27	2
Community involvement	16	36	45	3

48. Finally, the questionnaire offered companies a range of accounting-related activities which are known to have been successfully applied in organisations and which can contribute to both environmental sensitivity and economic success. In the light of this, the fact that only 75 per cent of respondents identified either accounting for energy costs and/or accounting for waste costs, and only 32 per cent are using accounting to help allocate environmental overheads, is disconcerting. We are looking here at some of the world's leading companies and they are not yet employing their accounting systems in those areas where the economic and environmental savings are the most pronounced and the simplest to identify. Identification of various costs was the most popular use of the accounting systems with, in addition to wastes and energy, EMAS costs (70 per cent), investment procedures (68 per cent), compliance costs (64 per cent) and packaging retrieval and disposal costs (56 per cent) the most popular. Other significant areas of accounting-related activity were environmental reporting (67 per cent) and identification of market opportunities (59 per cent).

FIGURE 11: COMPANIES EMPLOYING OR FAMILIAR WITH 'NEW' ACCOUNTING METHODS

	Percentage of Respondents who..		
	Are using this is approach	Are familiar (but not using) this approach	Are unfamiliar with this approach
Life Cycle Assessment with financial numbers assigned to physical flows	16	15	48
Extended cost benefit analysis	14	10	48
Full cost accounting (e.g. the Tellus Institute)	11	14	51
Eco-balance sheets/Oköbilanz (e.g. The Danish Steel Works) with financial numbers assigned	10	16	58
Net environmental value added calculations (such as that done by BSO/Origin)	8	4	74
Full cost pricing (e.g. EU Fifth Action Plan)	7	14	52
Social Auditing (e.g. Traidcraft or Sbn Bank)	7	0	77
Sustainable cost calculation (e.g. CSEAR)	5	3	78

49. The most striking results to emerge from this area, however, related to what companies did not see as important and/or on which companies were unsure as to how to proceed. It is now widely accepted[28] that any significant movement towards environmental sensitivity -- let alone towards sustainability -- requires a link to be drawn between the economic (financial accounting) performance and environmental performance of a company. The first step in this direction involves conventional financial accounting adjustments. For very few companies indeed are these matters unlikely to be important. However, a significant minority of respondents saw such matters as "not important/not sure how to". These included: disclosure in financial statements (25 per cent unimportant/14 per cent not sure how to); environmental contingent liabilities (18/19 per cent); environmental provisions (27/14 per cent); revaluation of land and inventory (19/12 per cent); relationships with shareholders and the financial community (21/4 per cent); meetings with analysts and ethical investment trusts (36/10 per cent); and liaison with the financial auditors (37/14 per cent).

50. Whilst some of these views on the lack of importance of financial accounting issues (as well as lack of clarity on procedure) could be traced back to (a) countries with either a less active stock market or an accounting profession which has taken less of a lead on accounting for the environment

and (b) industries which perhaps might be expected to be less exercised by such matters, this was by no means true in all cases. Indeed, a number of the respondents confirmed that many companies are either unaware of the financial issues that may attach to environmental matters or else they are simply waiting until their national government takes a firm lead and provides guidance on the treatment of these environmentally-related financial accounting questions.

III. CONCLUSIONS

51. This report is essentially an exploratory piece of research undertaken on a new and emerging area where little prior work exists to provide guidance. Based, as it is, on a range of postal questionnaires and cases, it cannot be regarded as representative of any country or industry. Nevertheless, thanks to the selection procedure used to identify companies, it is hoped that there is, in the results, a useful picture of how many of the world's more environmentally advanced companies are reacting to the emerging issue of sustainability. The majority of the questionnaires were completed by senior environmental executives and this should provide a flavour of how the top levels within leading businesses are thinking about the issue. However, it may be that such respondents were unable to answer as fully about some of the accounting issues as, say, a financial director might have done. The cases do not suggest that this is so. The cases (and some previous work[29]) suggest that accounting functions are more usually passive and often await direction from other areas of the business. This seems in accord with the results produced here.

52. With this in mind, the following tentative conclusions can be drawn:

(a) Most companies -- even leading companies -- have yet to examine fully the nature of sustainability and its implications for current business practices. The vast majority of companies are treating sustainability as an (implicit) extension of environmental management. It is highly unlikely that environmental management can provide sufficient impetus towards sustainability. It is almost certain that the 37 per cent of the respondent companies which believe that they are at or close to a sustainable state are quite simply mis-informed.

(b) While companies do not appear to have fully embraced all the eco-efficiency implications of sustainability, they do seem sensitive to and supportive of the eco-justice elements of the concept. However, the question of who has responsibility for addressing eco-justice issues emerged from the cases as a problematic area. This recognition is not uniform. A surprising 59 per cent of companies appear to believe that sustainability does not involve the needs of future generations. This is also a mis-informed view.

(c) The dominant conclusion which was drawn from this study is that further business-related research needs to be undertaken and much clearer guidance given to businesses world-wide on what sustainability may mean for business.

(d) Environmental managers are constrained in the actions they can take to move their companies along the path to sustainability. Traditional accounting comprises an important part of this constraint. The resultant conflict is more likely to occur in accounting/performance-centred organizations than in values-centred ones. It may also be more likely to occur in very large, centrally controlled organizations than in smaller or de-centralized companies. This is, however, a very tentative conclusion.

(e) The use of LCA and/or the oköbilanz approach to understanding a company's interaction with society and the environment seems to offer considerable promise. Not only will this aid companies in developing their environmental management systems but it will also help the company to identify and confront the issues of sustainability.

(f) The central messages about the assistance that accounting systems can

provide to companies addressing environmental issues has not yet been fully received. Much more can be done in (i) areas where environmental and economic savings can be made; and (ii) recognizing those areas of financial reporting where environmental costs must be identified and reported. Accounting needs to be fully integrated into a company's EMAS strategy.

(g) Other, more innovative approaches to accounting and sustainability need to be further researched, applied and disseminated. It is increasingly clear that there is value -- both economic and environmental -- in these approaches and while such approaches may not always produce the answers that a business (understandably) wants, sustainability -- and forward-looking business management -- demand a re-think of current business orthodoxy. Very few companies are active in the use of these techniques and not many more are actually familiar with them. For example, the EU must do a great deal more to explore and disseminate the implications of any approach to full cost pricing. It does not appear that this message has been understood as yet.

(h) It needs to be recognized that companies cannot be sustainable in the present economic climate. There is widespread agreement that the costs of sustainability-related adjustment will be considerable and to ask any company to act entirely as a philanthropist and/or avoid pursuit of traditional business opportunities is quite unrealistic. Businesses are successful at growth, efficiency, innovation and exploitation of markets. To expect such successful organisms to change their approaches -- without significant changes in the business environment -- is too optimistic. It is highly unlikely that any companies can be sustainable under present economic strictures. If sustainability depends on changes taking place within the current business orthodoxy, then it is not a realistic possibility.

(i) The pursuit of sustainability will involve all parts of society. Voters, consumers, employees, management, politicians etc., will have to address the issues as they relate to their own sphere of influence. Likewise, business and governments will have to confront challenging and difficult choices. In particular, national and pan-national governmental organizations must address sustainability firmly and produce an overview and guidance which only they are equipped to provide. Only then, within this wider context, may any realistic expectation of sustainable businesses be articulated and realized.

Notes

1. United Nations World Commission on Environment and Development. Our Common Future (The Brundtland Report). Oxford: Oxford University Press, 1987.

2. The two terms "sustainability" and "sustainable development" are used synonymously in this report although, for some, they have different connotations.

3. "Towards sustainability". Com(92) 23 final - Vol.I-III, Brussels, 27 March 1992.

4. The International Chamber of Commerce. Business Charter for Sustainable Development. Paris: ICC, April 1991 and first released at WICEM II.

5. EMAS, as the shortened version of the European Union's Environmental Management and Audit Scheme, will be used generically throughout this report to cover environmental management and environmental management systems -- including environmental audits.

6. An important and frequent fallacy is the assumption that efficiency is likely to lead to sustainability. As a company increases its efficiency with respect to resource use, it decreases its *unit* impact on the environment. Companies are a very long way from reducing this impact to either zero or, at least, to the

carrying capacity of the eco-system. If the company is simultaneously expanding and seeking growth -- as most successful companies tend to do -- then, despite the efficiency, the company's impact on the environment is very probably continuing *to increase*, not to decrease. Hence, decreasing per unit impact does not assure an overall decrease in impact.

7. See for example Chapter 14 of Gray, R.H., K.J. Bebbington, and D. Walters. Accounting for the Environment: The greening of accountancy Part II. London: Paul Chapman, 1993.

8. op. cit.

9. Pezzey, J. Definitions of Sustainability, (No.9). United Kingdom: CEED, 1989.

10. The issues of eco-justice and eco-efficiency are explored further in Gladwin, Thomas N. "Envisioning the sustainable corporation" in (ed.) Emily T. Smith. Managing for Environmental Excellence. Washington, DC: Island Press, 1993.

11. This brief summary draws especially from the work of Pearce and Turner see, for example, Pearce D. (ed.). Blueprint 2: Greening the World Economy. London: Earthscan, 1991; Pearce, D. "Towards a sustainable economy: Environment and economics". The Royal Bank of Scotland Review, No.172, December 1991, (pp.3-15); Pearce D., A. Markandya and E.B. Barbier. Blueprint for a Green Economy. London: Earthscan, 1989); plus that of Paul Ekins and Roefie Hueting (see, for example, Hueting, R. New Scarcity and Economic Growth: More Welfare through Less Production? Amsterdam: North Holland, 1980; Hueting, R., P. Bosch and B. de Boer. Methodology for the calculation of sustainable national income. Voorburg: Netherlands Central Bureau of Statistics, 1991; Ekins, P. A New World Order: Grassroots movements for global change. London: Routledge, 1992; Ekins, P. Wealth beyond measure: An atlas of new economics. London: Gaia, 1992).

12. This is explicitly point of view of man as the centre of existence. For a further discussion of this issue in an accounting context, see Gray, R.H. "Accounting and environmentalism: an exploration of the challenge of gently accounting for accountability, transparency and sustainability". Accounting Organisations and Society 17(5), July 1992 (pp.399-426) and Maunders, K.T. and R. Burritt. "Accounting and Ecological Crisis" Accounting, Auditing and Accountability Journal. 4(3), 1991 (pp.9-26).

13. It is well established that the rate of environmental degradation is accelerating. Recent attempts to increase global environmental sensitivity have only, so far, managed to slow the rate of acceleration. Most measures of environmental degradation reflect this. Most measures of economic success also demonstrate a rising trend. Two series which are clearly moving in the same direction point to a high level of correlation and therefore present a *prima facie* case for a relationship between the two.

14. The fuel source would move the line to the left or the right depending on whether it was coal-, natural gas- or nuclear-fuelled electricity generation.

15. Whilst conventional accounting comprises the financial record-keeping and information systems for the management of an organisation together with the annual reporting of financial information for shareholders and other stockmarket participants, accounting need not be so restricted. In principal all flows of information -- whether financial or non-financial -- can be seen as a form of accounting. It is in this sense that we use the term here. See, for example, Gray, R.H. "Corporate Reporting for Sustainable Development: Accounting for sustainability in 2000AD". Environmental Values 3(1) Spring 1994, pp.17-45; Gray, R.H. and K.J. Bebbington. "Accounting, Environment and Sustainability". Business

Strategy and the Environment. Summer 1993, pp.1-11.

16. See, for example, Bebbington K.J., R.H. Gray, I.Thomson & D.Walters "Accountants Attitudes and Environmentally Sensitive Accounting" Accounting and Business Research No.94 Spring 1994 (pp.51-75); Gray R.H., K.J.Bebbington, D.Walters & I.Thomson "The Greening of Enterprise: An exploration of the (non) role of environmental accounting and environmental accountants in organisational change" Critical Perspectives on Accounting (forthcoming);Gray R.H., D.L.Owen & K.T.Maunders Corporate Social Reporting: Accounting and accountability (Hemel Hempstead: Prentice Hall) 1987; Gray R.H., D.L.Owen & K.T.Maunders "Corporate social reporting: emerging trends in accountability and the social contract" Accounting, Auditing and Accountability Journal 1(1) 1988 (pp.6-20); Gray R.H., D.L.Owen & K.T.Maunders "Accountability, Corporate Social Reporting and the External Social Audits" Advances in Public Interest Accounting, Vol.4 1991 (pp.1-21).

17. There is some evidence that conventional shareholders are beginning to demand wider social and environmental information both through the ethical investment funds (see, for example, Harte, G., L. Lewis and D.L. Owen. "Ethical investment and the corporate reporting function". Critical Perspectives on Accounting 2(3) 1991, pp.227-254) and in more direct ways as environmental performance begins to excite shareholders (see, for example, Tilt, C.A. "The influence of external pressure groups on corporate social disclosure: Some empirical evidence". Accounting, Auditing and Accountability Journal, 7(4) 1994, pp.24-46 and Epstein, M.J. and M. Freedman. "Social disclosure and the individual investor". Accounting, Auditing and Accountability Journal, 7(4) 1994, pp.94-109).

18. For another insight into this see, for example, Hawken, P. The ecology of commerce: a declaration of sustainability. New York: Harper Business, 1993.

19. More detail on this is given in Appendix A.

20. These statements were drawn from a wide selection of literature and were expressed in terms which varied the implied message of support or lack of support for various interpretations of the concept.

21. Italy was the only country in which the EU Fifth Action Programme appeared to be notably influential.

22. See, for example, Pezzey op. cit..

23. See, for example, Bebbington, K.J., R.H. Gray, I. Thomson and D. Walters. "Accountants Attitudes and Environmentally Sensitive Accounting". Accounting and Business Research, No.94, Spring 1994, pp.51-75; Gray, R.H., K.J. Bebbington, D. Walters and I.Thomson. "The Greening of Enterprise: An exploration of the (non) role of environmental accounting and environmental accountants in organisational change". Critical Perspectives on Accounting (forthcoming). detail).

24. Elkington, J. (with Tom Burke). The Green Capitalists: industry's search for environmental excellence. London: Victor Gollancz, 1987; Elkington J., P. Knight and J. Hailes. The Green Business Guide. London: Victor Gollancz, 1991; Davis, J. Greening Business: Managing for sustainable development. Oxford: Basil Blackwell, 1991.

25. National industry associations were cited by 21% of respondents and industry-specific associations were cited by 29% of respondents. Of the different industry groupings, the chemical industry associations exhibited the greatest encouragement. Japanese and South African companies were more likely to be influenced by their national industry associations.

26. The percentages for responses to will/will not contribute towards sustainability do not add to 100%. The differences are companies which were unsure.

27. Additional constraints identified by companies included the absence of a trained and educated workforce, existing legislation, difficulty of changing organisations, and, perhaps most importantly, a lack of will and direction from society and government. Several mentions were made that society does not really want sustainability.

28. See, for example, Gray, R.H., K.J. Bebbington, D. Walters. Accounting for the Environment: The greening of accountancy Part II. London: Paul Chapman, 1993; Owen, D.L. Green Reporting: The challenge of the nineties. London: Chapman & Hall, 1992; Owen, D.L., R.H. Gray and R. Adams. "A green and fair view". Certified Accountant. April 1992, pp.12-15.

29. See, for example, Bebbington, K.J., R.H. Gray, I. Thomson and D. Walters. "Accountants Attitudes and Environmentally Sensitive Accounting". Accounting and Business Research, No.94, Spring 1994, pp.51-75; Gray, R.H., K.J. Bebbington, D. Walters. Accounting for the Environment: The greening of accountancy Part II. London: Paul Chapman, 1993; Gray, R.H., K.J. Bebbington, D. Walters and I. Thomson. "The Greening of Enterprise: An exploration of the (non) role of environmental accounting and environmental accountants in organisational change". Critical Perspectives on Accounting (forthcoming).

UNITED
NATIONS

TD

United Nations Conference
on Trade and Development

Distr.
GENERAL

TD/B/ITNC/AC.1/4
6 January 1995

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD

Intergovernmental Working Group of
Experts on International Standards
of Accounting and Reporting
Thirteenth session
Geneva, 13 March 1995
Item 7 of the provisional agenda

DISCLOSURE BY TRANSNATIONAL CORPORATIONS OF ENVIRONMENTAL MATTERS AT THE NATIONAL LEVEL IN ANNUAL REPORTS

Report by the UNCTAD secretariat */

Summary

Many transnational corporations (TNCs) adopt differing voluntary environmental accounting disclosure standards in their home and host countries. This report is a comparison of environmental accounting disclosures by TNCs in India, Malaysia and the Philippines as host countries of TNCs vis-à-vis the reporting by the same transnational corporations in their home countries. TNCs in the food and chemical industries were selected for study. It was found that there are considerable differences in reporting by TNCs at the local level and home country level.

*/ This report was prepared with the assistance of C. Noppeney of the Institute for Industry and the Environment at the University of St. Gallen, Switzerland.

GE.95-50079

CONTENTS

	Paragraphs
I. INTRODUCTION	1 - 18
A. Background and goals of the study	2 - 4
B. Conceptual background	5 - 6
C. Approach and methodology	7 - 18
1. Selection of the countries	7 - 8
2. Selection of the industries	9
3. Selection of the corporations	10
4. The questionnaire	11 - 15
5. Methodology	16 - 18
II. SURVEY RESULTS	19 - 25
III. CONCLUSIONS	26 - 28
References	
Annexes:	
Annex I: Questionnaire on environmental disclosure	
Annex II: Proposed common structure for sites environmental reports prepared by the European Chemical Industry Council (CEFIC)	
Notes	

I. INTRODUCTION

1. This report focuses on environmental disclosures by transnational corporations. It is restricted to a comparison between the environmental reporting practices by transnational corporations in host countries (all of which are developing countries in this project) with their home countries (which are all developed countries).

A. Background and goals of the study

2. In the United Nations publication, International Accounting and Reporting Issues: 1991 Review, it was reported that a comparison in Brazil of environmental reporting by transnational corporations revealed that "...none of the German and Swiss (parent) firms disclosed anything relevant in their reports, in spite of the fact that this information is disclosed in their home countries".

3. It appeared from the above scenario that transnational corporations with operations in some countries where regulations concerning disclosure of environmental information is somewhat weak may not always disclose information locally even though the parent company may disclose this information in a consolidated format in the home country. This would appear to be because the reporting requirements in the home country are more extensive.

4. It is the primary objective of this report to examine this observation and presumption in some detail. Environmental disclosures made by transnational corporations operating in selected developing countries, namely India, Malaysia and the Philippines, were analysed. In order to allow for the necessary level of comparability between the different cases, the examples were taken from two industries (chemical and food industries). The corporations were asked to submit for analysis all environmental information which is publicly available in the home and host countries. "Publicly available information" was considered to be any information, whether it is contained within the annual report, an environmental report or is available upon special request.

B. Conceptual background

5. Corporate environmental reporting is a relatively recent phenomena in the context of environmental management and corporate communications. It is rapidly becoming a primary channel for companies to communicate their thinking, objectives, practices and achievements in the field of environmental management. However, such reporting is still at an early stage of evolution and under the voluntary leadership of a variety of enterprises around the world. In recent years approximately 150 pioneering firms have published environmental reports[1]. These reports vary considerably in terms of scope and quality. Alongside these individual company efforts, some industry associations have begun to issue guidelines on environmental reporting. For example CEFIC, the European Chemical Industry Council, has been encouraging their member companies to publish such reports as soon as possible (more than 50% of CEFIC member companies published such reports in 1993), and it has prepared guidelines to achieve desirable consistency among firms[2].

6. According to a recent survey on company environmental reporting five levels of corporate environmental disclosure can be identified[3].

(a) Stage 1: "Green Glossies", newsletters, videos, etc.; short statement in annual report;

(b) Stage 2: Special initial environmental report, often linked to a first formal policy statement;

(c) Stage 3: Annual reporting linked to the environmental management system, but more text than figures;

(d) Stage 4: Provision of full TRI-style performance data on an annual basis[4]; input-output data for service companies[5]; corporate and site reports[6]. Information is available on diskette or through online computer systems. The environmental report is referred to in the annual report;

(e) Stage 5: Sustainable development reporting. Aim: no net loss of carrying capacity; linking of environmental, economic and social aspects of corporate performance, supported by indicators of sustainability; integration of full-cost accounting in financial reporting.

C. Approach and methodology

1. Selection of the countries

7. The project focused on three host countries: India, Malaysia and the Philippines. India was selected because of its economic and political importance in South Asia. Furthermore, it was assumed that the Bhopal disaster had increased environmental awareness and sensitivity in India, especially in the chemical industry. This expectation was confirmed by an international handbook on environmental business strategy: "India's commitment to planned and controlled development and welfare state norms has helped generate concern for the environment. The mining, food processing, heavy machinery and metal fabrication industries in India are leaders in providing information on their environmental performance. Government regulations require companies to disclose in Directors' Reports information on energy conservation and the company's use of pollution control technology."[7] Malaysia and the Philippines were chosen because of their recent economic progress and their role as newly industrializing economies.

8. Since the mid 1970s all three countries have experienced increased inflows of foreign direct investment. The embassies in Switzerland of all three countries were contacted and asked for information on their regulation of environmental disclosure in their countries[8]. In the case of India local authorities in New Delhi were also contacted. No responses to the inquiries were received.

2. Selection of the industries

9. The sample of enterprises for this project was chosen from two major global industries: chemicals and food industries. Both are of notable economic and ecological importance. The chemical industry was selected because it has a significant impact upon the environment and therefore enterprises are more likely to disclose environmental information. The food industry was chosen for two reasons: firstly, it was assumed that the production processes are very similar, irrespective of the national cultural or legal framework; secondly, the food industry was regarded as closely related to human health issues. Therefore, it was felt that there were strong incentives from the marketplace to disclose environmental information.

3. Selection of the corporations

10. Twenty-six transnational corporations were contacted: 18 companies in the chemical industry and 8 companies were in the food industry[9]. It is hardly possible to make generalizations beyond the sample although the findings are conclusive. Moreover, the sample was likely to be biased because the firms in the sample were regarded as the leading firms with respect to environmental managerial performance.

4. The questionnaire[10]

11. The questionnaire was designed to capture the type and extent of environmental disclosures made in both the home countries and the host countries. It was sent to the subsidiaries in the host countries. The survey instrument was influenced by the results of United Nations publication, Environmental Disclosures: International Survey of Corporate Reporting Practices

(E/C.10/AC.3/1994/4) and the proposals made in the CEFIC guidelines on environmental reporting for the European chemical industry.

12. The questionnaire consisted of four sections. In the first section the subsidiary was asked in a very general way about publications issued at the local level. Six examples were given: an annual report, an environmental section as part of the annual report, a separate environmental report, press releases on environmental issues, an environmental policy statement, and leaflets on environmental issues. Furthermore, the respondent was encouraged to mention everything else relevant to this topic.

13. The second section focused on the relationship between the disclosures at the corporate and subsidiary levels. It was designed to determine how information of the local subsidiary in the host country is disclosed at the corporate level in the home country. It was assumed that information concerning environmental matters is often disclosed in a consolidated format in the home country where reporting is more extensive.

14. The third section provided a structured overview of all kinds of environmental disclosures. Six major categories of different types of information were mentioned and illustrated by examples. The respondent was asked to mark every type of information which was publicly available in the host country, and to submit a concrete example. The types of information listed in the questionnaire were: environmental policy; environmental management; safety; economic and financial information; life-cycle of products and services; and, environmental effects of production activities (data).

15. In the fourth section the respondent was asked to identify the factors which could account for the current environmental reporting practice. Five factors were listed: legal framework; corporate environmental responsibility of the subsidiary; environmental policy of the parent company; pressure by environmental groups or others such as stakeholders; and pressure from the marketplace. The questionnaire concluded with a strong encouragement to contact the researcher to express further suggestions or questions.

5. Methodology

16. Initially, the headquarters of 28 transnational corporations in seven countries were contacted. They were requested to send the fax numbers of the subsidiaries in the three host countries and a copy of their most recent annual and environmental report. Twenty-four companies provided some telefax numbers and the publications requested or promised to provide the required information from their subsidiaries in the three countries. Four companies did not respond to the requests.

17. Secondly, a letter explaining the research project and the questionnaire were sent to 54 subsidiaries in the three countries. Furthermore, a number of responses were reported directly by the parent company.

18. Initially, the response rate from the developing countries was poor which necessitated follow-up action with both the subsidiaries and parent companies. By the end of project research period responses from 36 subsidiaries within the host countries were received. Nineteen were sent directly from the subsidiary in the host country and 17 were sent by their respective parent company. Of those responding, 11 filled out the questionnaire whereas the remaining 25 preferred to send a letter or informative material only. These 36 responses constitute the sample analysed in this report.

Table 1. Subsidiaries contacted

	India	Malaysia	Philippines	Total
Chemical Industry	15 (16)[11]	15 (16)	14 (15)	44 (47)
Food Industry	3	4	3	10
Total	18	19	17	54 (57)

Table 2. Details of the country and industry of the respondents

	India	Malaysia	Philippines	Total
Chemical Industry	11	8	10	29
Food Industry	2	2	3	7
Total	13	10	13	36

II. SURVEY RESULTS

19. The general finding from this project was that environmental disclosures in the host countries is very different from those in the home countries. The overall quantity and quality of the responses was disappointing. In general, environmental disclosure in the home country has reached stages 3 and 4 of the above typology whereas any environmental disclosure in the three countries sampled rarely covers aspects beyond stage 2.

20. Concerning the sample, two general conclusions can be drawn. The first refers to differences between the two industries. The overall reaction from the food industry was more reserved than the responses from the chemicals industry. In summary, environmental disclosures in the food industry within the host countries could not be evaluated with the exception of replies from Nestlé (India, Malaysia and Philippines) and Pepsi-Cola International (Philippines)[12]. On the other hand, chemical companies could be expected to present some sort of general commitment to environmental issues (e.g. environmental policy statement). Therefore, a corporation from the chemical industry is more likely to have already taken first steps in environmental disclosure and published at least an environmental policy statement.

21. The second general finding concerns geographical differences between the three host countries. Subsidiaries in India tended to disclose more information than those in the two other host countries. The following Indian regulations require disclosure of information regarding conservation of energy within the annual report of the local subsidiaries: the Indian Companies Act, 1956 when read with Rule 2 of the Companies Rules, 1988 (Disclosure of Particulars in the Report of Board of Directors) and Section 217 (2-A) of the Companies Rules, 1975 (Particulars of Employees), as amended. Details of the total power and fuel consumption as well as statistics for the various segments (electricity, coal, furnace oil, other generation) are required[13]. Moreover, some Indian companies provide details on energy consumption per unit of production. Assuming that the product mix is constant over a certain period, these figures illustrate the change

(improvement or deterioration) of production efficiency as far as energy is concerned.

22. This legal obligation may have given rise to further environmental disclosures within the framework of conventional financial reporting (annual reports): in the case of Nestlé India and Hindustan Lever Limited a supplementary section on the concern for the environment was included. These sections provide information on various projects and recent environmental improvements.

23. As a consequence of the limited sample size obtained, the following findings refer to single cases:

(a) Detailed reports providing full TRI-style performance data have become very common for the production sites in the home countries. Nevertheless only one company submitted material which can be regarded as an environmental site report in the narrow sense of the term[14]. The site report of Tioxide (Malaysia) Sdn Bhd, a subsidiary of ICI, consists of seven pages and informs about the following topics:

(i) environmental policy;

(ii) the environmental risks of the production process;

(iii) total waste (data for different categories);

(iv) by-products;

(v) environmental management systems;

(vi) emissions inventory for emissions to air, discharges to water and wastes to land (20 substances);

(vii) energy use and carbon dioxide emissions;

(viii) complaints and community relations.

(b) Several companies submitted explicit environmental policy statements or material which can be interpreted as an environmental policy statement published by their subsidiaries in the host countries[15]. In some cases these statements were translations (English as well local languages) of their corporate policy statements as they had been adopted and reported in the home countries. Some policy statements seemed to be adapted to local needs in the three host countries. In addition to appearing in separate publications, these environmental policy statements were sometimes also integrated with the local annual reports.

(c) In the case of Ciba-Geigy it was obvious that the type of environmental disclosure at a particular site correlates with the activities carried out at the location. For example, in Malaysia there are no manufacturing facilities. Consequently, local communication tends to be geared more towards involvement in educational and community activities, employee information (which is also available to the public), as well as regular communication with government offices. Similar characteristics apply to the site in the Philippines where some pharmaceuticals production takes place. On the contrary, the facilities in India are much larger and have more production and the information available to the public is structured accordingly. It consists of (among other items):

(i) An "Our Vision" brochure which is for both internal and external use;

(ii) "Health and Safety Policy" and "Energy Policy" for India, again for both internal and external information;

(iii) A brochure about the Santa Monica works which provides information about the business operations as well as activities related to environmental protection, safety and health;

(iv) The magazine of the Central Pollution Control Board in New Delhi, which features a photograph of the neutralization system at the Santa Monica site;

(v) Other information if requested. It is Ciba-Geigy policy worldwide to provide such information unless it is of a confidential nature.

24. In a number of cases environmental information is available on special request. For example, detailed economic and financial information was disclosed in the questionnaires returned by six firms[16]. According to Bayer Philippines the figures given were not publicly available but may be requested from the Philippine Fertilizer and Pesticide Authority.

25. As far as information on safety and accidents at work is concerned, Hoechst reveals detailed figures for all three host countries in a leaflet published in the home country (Germany). The leaflet is in the German language and has not yet been translated. It covers all accidents at work worldwide listed by country level.

III. CONCLUSIONS

26. A number of companies incorporate a pledge to worldwide environmental reporting in their corporate report. Typical phrases include:

(a) "This report concerns all Rhone-Poulenc businesses worldwide. Every plant must also publish its own year-end results for the benefit of neighbouring communities, as well as its objectives for the following year"[17];

(b) "Furthermore, all plants (high risk or not) are informing the public about the environmental impact of their activities"[18];

(c) "It is essential that Monsanto continue to be fully and publicly accountable ... We chose to disclose Monsanto's data on emissions and releases directly to our communities, ... environmentalists and the media."[19]

27. However, the findings of this report suggest that in some instances companies may not always disclose information on a consistent basis world wide. It must be kept in mind that the whole concept of environmental disclosure is a recent development. It was not until 1990 that the first environmental reports were published and only in 1992 did "Agenda 21", the core document that emerged from the 1992 United Nations Conference on Environment and Development (UNCED), call on businesses and industry to "report annually on their environmental records, as well as on their use of energy and natural resources". Taking these aspects into account, it seems to be reasonable and obvious that a comprehensive environmental reporting system has only recently been introduced in the home countries and the worldwide implementation has not yet been completed.

28. The difference between the two industry sectors studied points to public exposure as the key factor accounting for different reporting practices. Of course, the legal framework in each country also influences corporate environmental reporting practices. But in the light of the large number of voluntary disclosures it seems to be rather implausible to regard legal forces as a key factor for more comprehensive environmental disclosure. Instead of more stringent environmental regulations a growing environmental concern of the public in the three host countries may contribute to real progress in future environmental disclosures.

Table 3. Subsidiaries contacted (chemical industry)

Chemical Industry	Addresses of subsidiaries were provided?	Environmental report from home country available?	Subsidiaries contacted	Subsidiaries responding	Subsidiaries responding with respect to environmental disclosure	Subsidiaries with some sort of environmental disclosure
AKZO	YES	YES	2	0	0	0
BASF	YES	YES	3	2	2	1
BAYER	YES	YES	3	1	1	0
BP	YES	YES	3	0	0	0
CIBA GEIGY	complete information was provided by the parent company in Switzerland	complete information was provided by the parent company in Switzerland	complete information was provided by the parent company in Switzerland	complete information was provided by the parent company in Switzerland	3 (complete information was provided by the parent company in Switzerland)	3 (complete information was provided by the parent company in Switzerland)
DOW	YES	YES (including European site reports)	3	3	3	3
DU PONT	YES	YES	3	0	0	0
ESSO	NO	NO	0	0	0	0
HENKEL	NO	YES	0	0	The parent company responded to our inquiry	0
HOECHST	YES	YES	3	3	3	3
ICI	YES	YES	3	3	3	2
MONSANTO	YES	YES	3	3	0	0

NORSK HYDRO	YES	YES	3	1	1	0
PROCTER & GAMBLE	YES	YES	3	0	0	0
RHONE-POULENC	YES	YES	3	1	1	0
SHELL	YES	YES	3	1	1	0
UNILEVER	YES	YES	3	0	0	0
UNION CARBIDE	YES	YES	3	2	2	1

Table 4. Subsidiaries contacted (food industry)

Food Industry	Addresses of subsidiaries were provided?	Environmental report from home country available?	Subsidiaries contacted	Subsidiaries responding	Subsidiaries responding with respect to environmental disclosure	Subsidiaries with some sort of environmental disclosure
CADBURY SCHWEPPES	NO	NO	0	0	0	0
COCA COLA	NO	NO	0	0	0	0
GRAND METROPOLITAN	YES	YES	1	0	0	0
HEINEKEN	YES	YES	2	1	1	0
KRAFT GENERAL FOODS	YES	YES	1	1	1	1
MC DONALDS	NO	NO	0	0	0	0
NESTLE	YES (complete information was provided by parent company in Switzerland)	YES (complete information was provided by parent company in Switzerland)	3 (complete information was provided by parent company in Switzerland)	3 (complete information was provided by parent company in Switzerland)	3 (complete information was provided by parent company in Switzerland)	3 (complete information was provided by parent company in Switzerland)
PEPSI	YES	YES	3	2	2	1

Table 5. Survey results (chemical industry)

Chemical Industry	Number of cases	Cases reported by the headquarters	Cases reported by the subsidiary	Returned questionnaires
AKZO	0	0	0	0
BASF	2	0	2	0
BAYER	3	2	1	1
BP	0	0	0	0
CIBA GEIGY	3	3	0	0
DOW	3	3	0	0
DU PONT	0	0	0	0
ESSO	0	0	0	0
HENKEL	2	2	0	0
HOECHST	3	0	3	3
ICI	3	1	2	1
MONSANTO	3	3	0	0
NORSK HYDRO	1	0	1	0
PROCTER & GAMBLE	1	0	1	0
RHONE-POULENC	1	0	1	0
SHELL	1	0	1	1
UNILEVER	1	0	1	1

UNION CARBIDE	2	0	2	1

Table 6. Survey results (food industry)

Food Industry	Number of cases	Cases reported by the headquarters	Cases reported by the subsidiary	Returned questionnaires
CADBURY SCHW-EPPES	0	0	0	0
COCA COLA	0	0	0	0
GRAND METRO-POLITAN	0	0	0	0
HEINEKEN	1	0	1	1
KRAFT GENERAL FOODS	1	0	1	0
MC DONALDS	0	0	0	0
NESTLE	3	3	0	2
PEPSI	2	0	2	0

References

CEFIC, 1993, CEFIC Guidelines on Environmental Reporting for the European Chemical Industry. Brussels.

Clausen, J. and K. Fichter, 1993, Vorstudie zum Projekt Umweltberichterstattung. Berlin.

International Institute for Sustainable Development, 1992, Business Strategy for Sustainable Development: Leadership and Accountability for the '90s. Winnipeg, Canada: IISD.

Monsanto Chemical Co., 1993, Environmental Annual Review 1993: Building a Sustainable Future.

Rhône-Poulenc, 1993, Environment Report 1993.

United Nations, 1994, Environmental Disclosures: International Survey of Corporate Reporting Practices, E/C.10/AC.3/1994/4.

United Nations Environment Programme, Industry and Environment Programme Activities Centre, 1994. Company Environmental Reporting, Technical Report Series No 24. Paris, United Nations.

Annex I
QUESTIONNAIRE ON ENVIRONMENTAL DISCLOSURES

1. Do you publish at a subsidiary level:

- an annual report?
- a section on environmental issues as part of your annual report?
- a separate environmental report?
- press releases on environmental issues?
- leaflets on environmental issues?
- an environmental policy statement?
- anything else (please explain)?

2. Is your environmental information (data, expenditures etc.) integrated into a corporate environmental report of the corporate annual report of your parent company?

3. What types of environmental information are publicly available? Please send us an example.

a) Environmental policy

- View on environmental demands
- Principles
- Targets (qualitative or quantitative objectives)

b) Environmental management

- Environmental management systems
- Major programmes
- Environmental audits
- Human resources, training and educations
- Environmental officer and health safety staff

c) Safety

- Accidents
- Injuries
- Risks/environmental risk assessment
- Emergency preparedness
- Lost working days

d) Economic and financial information

- Total expenditures
- Capital expenditures
- Operating costs
- Remedial expenditures
- Research and development expenditures
- Liabilities

e) Environmental life-cycle of products and services

- Energy
- Resources
- Emissions
- Waste

f) Environmental effect of production activities (data)

- Energy generation and consumption
- Resource consumption data
- Emissions data

- Waste and by-products

4. What factors do account for your environmental reporting practice?

- The legal framework in your host country?
- The corporate environmental responsibility of the subsidiary?
- The environmental policy of your parent company?
- Pressure by environmental groups of other stakeholders?
- Pressure from the marketplace?
- Other factors (please explain)?

In addition to this questionnaire we would like to receive samples of your environmental reporting.

Annex II

PROPOSED COMMON STRUCTURE FOR SITES ENVIRONMENT REPORTS PREPARED BY THE EUROPEAN CHEMICAL INDUSTRY COUNCIL (CEFIC)

When environment reports are established or individual sites of a company, it is recommended that they be drafted along the following headings:

1. Forward

- Site manager address
- Company environment policy
- Company environmental objectives (medium-long term)

2. Site description

- Main units, main products
- Site put into perspective
  - usage of products
  - economic contributions and employment
  - relations with authorities and local community
- Environmental situation: local conditions of air, water etc. in the neighbourhood, sensitive areas, etc.
- Legal requirements: permits, emission limit values, etc.
- Controlling authorities (national, local etc.)

3. Environmental management

- Structure (human resources and organisational)
- Programmes and objectives
- Environmental protection techniques (water treatment, waste incinerator, waste minimization, etc.)
- Integrated approach (recycling and new technologies)
- Monitoring techniques/systems (data measured/calculated/estimated)
- Emergency plan

4. Data (with comparison with data on previous years)

- Emission data
- Selected details (noise, odour etc.)
- Health and safety data
- Complaints (optional)
- Spending on environmental protection

5. Communications

- Community relations
- Open days

6. General comments

7. Contact people

Note: Information should be adopted to site specifications and local expectations.

Notes

1. According to a recent survey by a German research team 127 companies have published an environmental report (Clausen/et.al. (1993), p. 10). A recent report by UNEP evaluates the environmental reports of 100 environmental reporting pioneers (UNEP Industry and Environment Program (1994), p. 5).

2. CEFIC (1993).

3. UNEP Industry and Environment Program (1994) p. 28.

4. TRI stands for Toxic Release Inventory. In the United States companies report annually certain TRI pollution data for more than 300 chemicals.

5. Environmental reports at this stage cover the range of substances going through the entire production process (from the input to the output).

6. It is crucial to distinguish between site and corporate-wide reporting. A site report deals with the environmental effects of a particular production site, whereas a corporate environmental report aggregates the information of a number of sites at the corporate level.

7. IISD (1992), p. B91.

8. cf. Annex I.

9. Tables 3 and 4 provide information about the selected transnational corporations.

10. cf. Annex II.

11. This number includes the cases directly reported by the parent company.

12. There were three other subsidaries responding to the inquiry but none of them submitted any information on environmental disclosures. In the case of Kraft General Foods Philippines the response only referred to the very general information previously submitted by the parent company. For Pepsi-Cola, the results are significant: Pepsi Cola International (Philippines) submitted a wide range of information: the environmental effect of production activities (wastewater characteristics), capital expenditures on wastewater treatent, environmental policies and environmental management systems including goals and action plans. In contrast to Pepsi Cola International (Philippines), the Indian branch, Pepsi Foods Limited in New Dehli, reported that the "...activities in which [they are] presently engaged [are] of a non-polluting nature." For this reason they "...do not publish any report on environmental issues/information." The third case comes from a subsidary of Heineken that stated that the survey did not apply to their company.

13. This is the legal norm for all annual reports filed with the Indian government. Consequently a comparable section on the conservation of energy was available from BASF India Limited, Bayer (India) Limited, Hoechst India Limited, Nestlé India Limited and Hindustan Lever Limited.

14. A comprehensive environmental site report should provide a full picture of its environmental impact. A structure coming up to this expectation was proposed by the European Chemical Industry Council (CEFIC) in June 1993 (cf. Annex II).

15. Seven responses were received which included at least aspects of an environmental policy statement: Dow Pacific, answering the inquiry to their offices in the three host countries, sent an English version of their corporate environmental policy; the Indian and Malaysian subsidaries of ICI PLC submitted an environmental policy statement published by the local subsidaries. The same occurred for Ciba-Geigy India, Hoechst Philippines Inc., Hindustan Lever Ltd. and Nestlé (Malaysia).

16. Hoechst India, Hoechst Malaysia, Hoechst Philippines, ICI India, Nestlé India, and Union Carbide Philippines.

17. Rhône-Poulenc (1993), p. 3.

18. Rhône-Poulenc (1993), p. 24.

19. Monsanto (1993), p. 3.

UNITED
NATIONS

TD

United Nations Conference
on Trade and Development

Distr.
GENERAL

TD/B/ITNC/AC.1/5
5 January 1995

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD

Intergovernmental Working Group of
Experts on International Standards
of Accounting and Reporting
Thirteenth session
Geneva, 13 March 1995
Item 4 of the provisional agenda

THE INTEGRATION OF ENVIRONMENTAL PERFORMANCE INDICATORS WITH FINANCIAL INFORMATION BY TRANSNATIONAL CORPORATIONS

Report by the UNCTAD secretariat */

SUMMARY

This report is on a study that was undertaken to examine the potential for integrating financial and environmental performance reporting. The analysis is supported by case studies of six Swedish enterprises. It has been concluded that the integration of business and environmental performance reporting is likely to develop for several reasons. It will probably not, however, come about as add-on information to traditional enterprise reports. The potential is to be found in refining the format and structure of performance reporting in general. Enterprises with clear and understood site dependency, low exposure to short-term pressures from the financial markets, high integrity in management, materially viable production processes, and quality-conscious customers will be early in developing new performance measures. Reporting practices which support internal control in enterprises are a sound basis for the development of information disclosures. Agencies within governments should be prepared to differentiate their policies regarding transnational corporations. However, the conditions for sustainable development differ among enterprises, industries, countries, and regions of the world. Governmental activities supporting a sustainable development should differ accordingly.

*/ This report was prepared with the assistance of Sören Bergström, Bino Catasus, Maths Lundgren and Hans Rämö, all of the Stockholm House of Sustainable Development.

GE.95-50073

CONTENTS

		Paragraphs
INTRODUCTION		1 - 6
I.	THEORETICAL FRAMEWORK	7 - 13
II.	SUSTAINABLE DEVELOPMENT AS A MANAGERIAL ISSUE	14 - 17
III.	CORPORATE ENVIRONMENTAL REPORTING	18 - 27
IV.	CASE STUDIES	28 - 30
V.	REPORT DISCLOSURES FOUND IN THE CASE STUDIES	31 - 55
	A. The environment and general management	33 - 41
	B. Environmental audits and internal environmental reports	42 - 46
	C. Disclosure of environmental information, external certification and other matters	47 - 50
	D. Integration of environmental and financial performance measures	51 - 55
VI.	THE POTENTIAL FOR INTEGRATING BUSINESS AND ENVIRONMENTAL PERFORMANCE INFORMATION	56 - 69
	A. Potential for developing environmental reports in monetary terms	56
	B. Potential for developing holistic performance indexes	57 - 62
	C. Potential for refining the structure of performance information	63 - 69
VII.	CONCLUSIONS	70 - 79
	A. Differences between industries	70 - 71
	B. Importance of market and legislative contexts	72 - 76
	C. What may and may not be accomplished in the future	77 - 79
References		
Notes		

INTRODUCTION

1. The Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR) has previously investigated the disclosure of environmentally relevant information by transnational corporations. The findings so far have indicated a general impression of sluggishness of concerns about environmental issues in the business agenda. With this background, ISAR decided to study the subject of environmental disclosures by enterprises from another approach: the objective was not to obtain a quantitative record of certain corporate practices but to use a few case studies as a point of departure for a qualitative analysis of potentials in the field. The main focus in this report is ways to integrate environmental performance indicators into a framework of general business performance measures.

2. It is initially necessary to elaborate on the context of the issue. Who are the users of company reports? What reasons would justify an integration between financial and environmental reporting? To what extent should internal control considerations influence standards for external disclosures (and the other way around)? Generally, environmental performance indicators may be used for several reasons such as an assessment tool within internal environmental management systems, a way to inform potential investors and shareholders, a media for dialogue and negotiations with authorities and with suppliers and customers, etc. Still it is an open question about whether that kind of information should be integrated into regular company reports, if it should be integrated in some other way or if it is better if the information is reported separately in some way.

3. The financial performance of transnational corporations (TNCs) is important to financial markets world wide. Participants in those markets tend to treat corporations in a standardized way which is one reason behind claims for rigor in company reports; people with no experiences with the company as a physical entity whatsoever should get a proper impression of it.

4. Environmental performance is traditionally not in the set of relevant information for the investing community. Until recently environmental performance was only a local issue: smoke from the chimney, chemicals in sewage water and noise from traffic. Politically, the issues have for a long time been important at the municipality level, while international regulation of these activities has occurred only lately. Neither the local authorities nor international bodies have had any specific use for the integration of business and environmental performance.

5. Many persons consider that the use of integrated performance measures should be part of internal control systems in the first place. Responsive enterprises with a clear strategic view of their role in world-wide throughput of matter and energy, with policies for ethical sales, climate change, local responsibilities, throughput thrift, etc., will most certainly need reports on performance covering all such aspects. Then integration is important.

6. After the world conference on the environment in Brazil in 1992, the idea of sustainable development as the first priority in all political assemblies and as the prime guideline for individual and enterprise actions became generally accepted, at least in principle. One practical consequence is a need for responsive TNCs. Governmental and international bodies must then form a supporting environment for such enterprises. Disseminating the experiences of ways to integrate performance reporting may both facilitate access to "responsive" practices and, indirectly, raise the general expectation for enterprises to be responsive. If this is successful, it is likely to lend support for international standards for environmental regulations and taxation. That will, alongside explicit standards for performance information disclosures, give responsive enterprises a competitive advantage. It will also give readers of advanced performance reports solid guidelines for how to interpret the facts and figures.

I. THEORETICAL FRAMEWORK

7. It is often assumed that financial performance is generally considered to be of primary interest and environmental performance tends to get isolated and downgraded if it is expressed in a mode very different from generally used economic language. The study will now consider the accuracy of that assumption and ways to integrate environmental and financial considerations in enterprise reports.

8. In the literature there are two broad classifications for management behavior: one can be recognized as "empirical" and the other as "normative". The empirical classification is based on propositions of the following types (Andrews 1949, Cyert & March 1963, Chandler 1977, Earl 1983, Douglas 1986, Drucker 1993 and others):

(a) Companies try to keep their risks low. Business management is seldom gamesmanship. When risks are taken they are out of perceived necessity.

(b) Companies aim at long term survival. One should expect special reasons when shortsightedness prevails in management thinking.

(c) Companies behave "ecologically" in relation to their environments; they try to adapt to environmental changes and they try to make the environment adapt to the company.

(d) Leadership in companies is idealistic. Political and technical ideas, personal dreams and cultural blindness form strategies and company structures. Cost-and-revenue arguments normally appear late in decision processes.

(e) Decision processes in companies are most often characterized by limited rationality. The idea of rationality is almost never abandoned, but relatively few alternatives are seriously considered when making decisions and all criteria are seldom, if ever, weighted against each other.

9. The empirical model generally provides a favorable picture of company behaviour. These features can be expected to be found in healthy and prosperous companies where management has considerable integrity. That integrity may get challenged in various situations. One such challenge occurs when the company in question is a subsidiary of a transnational group and the parent company management prescribes specific behavior and performance at the subsidiary level.

10. Functional differentiation within a group may also be reflected in a distorted view of the real conditions of the operations in each local company. A company which is eager to attract money from the financial markets (whether it is debt or equity money) becomes dependent on the speculative short-sightedness that guides those markets. Financial operations provide a high opportunity cost for the internal use of money and may thus influence corporate structures. Generally, when dealing with economic hardships, managements have to act with less long-term considerations. Then the empirical evidence comes close to the standard assumptions which direct the normative model.

11. The normative model prescribes company characteristics such as price orientation, reactionary rather than innovative behavior, short-term profit maximization, and a minimum legal compliance attitude to environmental issues.

12. When debating company roles in achieving sustainable development, the normative model dominates the scene. Consequently, the focal issue most often is about forcing companies considered as being extremely short-term oriented to disclose environmental and long-term information.

13. This study acknowledges this background, but still gives the empirical model a chance by avoiding descriptive techniques which put the environment outside business considerations at the outset. Each enterprise in the case studies is described as a value-driven set of capital and operations, which are defined as the *corporate effort*. *Values* in this respect may be recognized as specific service qualities strived for, shareholder claims or other strategic targets as they are articulated by corporate management. In this way the environment appears

on equal footing with other resources which are utilized and/or assumed: the specific set of capital and operations under management requires a throughput of human, financial and material resources. Figure 1 presents a formal picture of the basic scheme in the case studies.

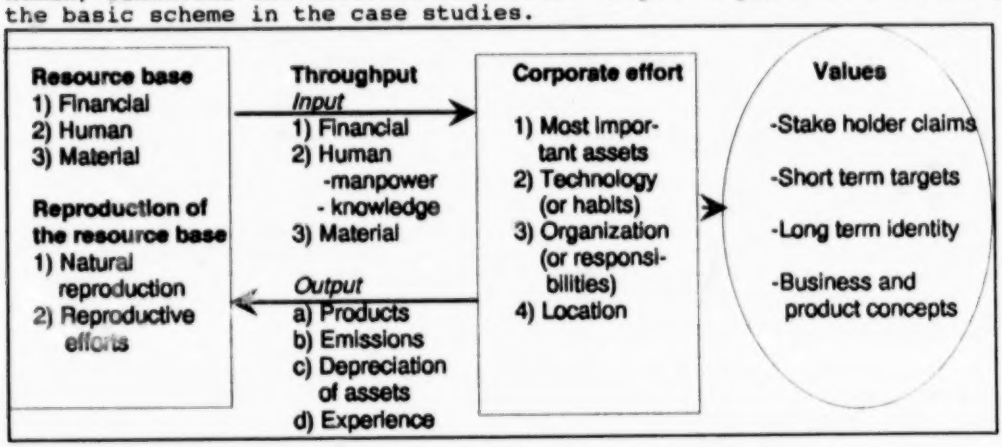

Figure 1: The general structure in the case studies.

II. SUSTAINABLE DEVELOPMENT AS A MANAGERIAL ISSUE

14. How does the environment appear as a managerial issue? An enterprise may reduce air emissions by a certain percentage or volume or improve the quality of its emissions. However, if this enhancement is at a significant cost and has consequently led to an increase in investment, how should this be best reported? This question has an obvious time dimension since the investment in a long-run context may both save costs and increase revenues, while it may result in a loss if forced on an enterprise with short notice. Alternatively, energy consumption may be reduced through a more fuel-efficient industrial process which may also result in cost savings in the long run. Another example could be more stringent pollution regulations which in turn lead to more expensive industrial processes and subsequent increases in operating costs.

15. Figures on different measures such as energy consumed, percentages of recycled materials used, output of pollutants, etc. are frequently used to indicate the environmental part of the issue. But what about the business part?

16. From this general background it can be concluded that environmental considerations will play an increasingly important role in corporate behavior in the future. Thus, it is in the interest of management to integrate environmental and general performance information of the enterprise with each other. Technically, such integration can be made in three broad ways:

(a) Reductionist approach. Information available in various physical measures, financial figures, technical estimates, etc., are reduced to <u>one</u> of those measurement units -- typically money, energy or pollutants units;

(b) Holistic approach. All information is put into a single image -- typically an abstract numerical index; or,

(c) Structured approach. A regular use of a rigorous format (typically an accounting format) which facilitates the interpretation of various performance indicators and their use for decision making purposes.

17. Behind such technical differences more fundamental differences in the way to perceive a corporation may be found. Reductionist approaches may be worth consideration in compliance-oriented companies when sustainable development and environmental relations appear as marginal changes to ordinary business habits. Structured approaches, on the other hand, open up a whole field of radical

possibilities, for instance to analyze the company as an ecological entity. If enterprises were to be analyzed as ecological entities, entirely new ideas would follow. New business opportunities might be identified as well as industry concepts, social dynamics and ways to understand economic relations.

III. CORPORATE ENVIRONMENTAL REPORTING

18. The study, "Environmental Management in Transnational Corporations" (United Nations, 1993), reports on an extensive survey of transnational corporations. The report concludes that the national legal and cultural environment from which a transnational company comes from is significantly important for management style and enterprise strategy. Any place in the world is specific in the respect that "all business is local". To set the conditions for environmental reporting, and especially for discussing options for integrating environmental and financial information, much specific company information is needed. One has to understand the kind of environmental conditions which prevail to judge what comparisons can be made and what methods can be used.

19. In the literature there is not much empirically-based evidence on company practices involving the relationships between financial and environmental performance. The surveys conducted by the United Nations, for the most part, documented a low profile regarding any environmental disclosures among the transnational companies studied. The 1992 survey report covers 222 transnational companies on accounting for sustainable development and environmental disclosure in general. Only 7 companies (3%) had amounts of their environmental debts in their annual reports. Other figures were more common:

(a) 14% had footnotes in their balance sheets on environmental conditions;
(b) 62% disclosed information on environmental improvements;
(c) 64% had text on financial outcomes of environmental problems in their annual reports;
(d) 70% told the general public about their environmental policies; and,
(e) 86% had at least something to say about the environment.

20. The United Nations report concluded that the general quality of public environmental information is low, never audited and very seldom quantified. There is no information for making comparisons between companies intelligible:

> "...while transnational companies are aware of environmental issues, their disclosures remain qualitative, descriptive, partial and difficult to compare. Not only was there little quantitative information but often no time period was attached to the qualitative information. Moreover, there was no relationship drawn among amounts spent, results achieved and targets set. Therefore, it was not possible to gauge the environmental performance of the corporations, let alone the impact of their environmental activities on their financial results." (United Nations, 1992, page 4)

21. The fact that the biggest companies do so little to raise the visibility of their corporate culture could be attributed to their low aspirations in the field, but, says the United Nations report, one should not underestimate the difficulties at hand. When estimating environmental debts and environmental costs one has to consider the following:

(a) The debts are uncertain because they are determined by future laws and regulations;
(b) They extend over a longer period than most debts and costs;
(c) Invisible critical thresholds make cost and debt functions discontinuous;
(d) Environmental damage is harmful to many. Management can never know absolutely which persons are affected, or how many of them may claim compensation;
(e) If an enterprise goes beyond the levels required by the law in its long-term responsibilities there will usually be a trade-off position against

short-term profitability.

22. The United Nations study also points to differences in legislation among countries. Accounting practices differ from one country to another regarding what is accepted as ordinary costs, what should be registered as an investment and what is acceptable as a cost during an accounting year. Some countries allow extraordinarily short periods for depreciating or amortizing environmental investments for income tax purposes. There are also legal clauses, for example in Canada and Sweden, that force companies to accumulate provisions during the lives of assets for clean-up costs that will come at the end of the lives of those assets.

23. In the 1993 United Nations survey it was also reported that about one-third of the companies claim that they have environmental accounting of some sort, "...however, no examples of concrete methodologies were submitted." (United Nations, 1993, pages 75 and 171)

24. At the same time a more optimistic outlook about the issue is emerging. A recent survey by TRG Revision, a Swedish subsidiary of the accounting firm of Deloitte Touche Tohmatsu International, reported a considerably growing interest in environmental reporting among the companies listed on the Stockholm Stock Exchange, although no connections with overall company performance measures was discussed. In 1991 McKinsey & Co., an international consultancy firm, reported that out of 400 companies 92% perceived the environment to be one of the big challenges of the next century. (United Nations, 1993)

25. Current developments in the "Total Quality Management" field may point to new possibilities (Bergström and Gummesson 1994; Welford and Gouldson 1993). The Environmental Management and Audit Scheme (EMAS) recently promulgated by the European Commission is one such possibility. As the scheme is recent, it's practical implications are speculative: EMAS should raise environmental awareness in many companies as a first step. The programme is designed to be compatible with practices in the dominating industrial enterprises in the European Union. This means that it may counteract ambitions and functions in enterprises that are environmentally more radical.

26. When high environmental standards are a customer claim, the issues more easily become a part of "normal business". Public bodies such as government agencies, municipal administration, schools, etc. may serve as quality conscious forerunners on the demand side of the market. Standards set on office equipment, building materials, copy paper, etc. will soon expand to other demand sectors. The evidence from Sweden is strong on this point.

27. The research in recent years by the Stockholm House of Sustainable Economy and the environmental research group at Stockholm University School of Business has shown that site consciousness is one of the crucial conditions for a company to become seriously "green". Consequently radical practices in reforming economic concepts, accounting and reporting, etc., are first developed by municipalities, local housing companies and similar organizations with no alternative to staying with "their" environment. This study uses parallels to that research for discussing possible future developments in transnational corporations.

IV. CASE STUDIES

28. For the purpose of this report, six case studies were undertaken to provide a basis for forming conclusions as to the feasibility of linking environmental performance indicators with the financial and other information normally supplied by enterprises. The case studies were selected to represent different kinds of environmental problems encountered by enterprises and, of course, do not cover all possible cases. However, it is felt that these cases provide good potential for being able to formulate recommend ways to integrate business and environmental performance reporting.

29. All the cases follow the same pattern:

(a) A short general background is provided on the company and its position in the company Group. All of the case studies describe a Swedish unit as part of a transnational Group. Two are international Group headquarters (Volvo and Astra), and four are subsidiaries in a Group (Sunwing, WMI Sellbergs, McDonald's and Stora) of which two of the latter four have a Swedish parent company (Sunwing and Stora). In combination with some notes on company history this background provides the overall conditions for performance reporting by the company.

(b) Some information is given on company policies, strategies, operational targets etc., which provided relevant performance criteria for analysis purposes.

(c) There is a brief presentation on the industry which is necessary to understand the kinds of environmental issues that are appropriate to be raised. The cases are substantially different in this respect:

(i) WMI Sellbergs' environmental concern is central to the business idea of the company. Re-use and recycling is what is offered to their customers.

(ii) Sunwing Hotels manage hotel establishments around the world. The hotel industry has generally demonstrated awareness of the importance of good environmental management.

(iii) Svenska McDonald's is the Swedish branch of world's most well-known fast foods chain. The Group has made a well-recognized upgrading of it's environmental profile in many countries.

(iv) AB Volvo as a car manufacturer displays most of the typical features of the old industries. The company is known to employ environmental considerations in product design. Within the automobile industry, environmental arguments have become increasingly important in marketing products.

(v) STORA Skog is one of the largest forestry companies in Sweden within which a serious environmental debate is going on.

(vi) Astra is a very competitive company in medical drugs. The pharmaceutical industry operates under extreme testing, documentation and safety conditions. Companies are generally law-driven and conservative.

(d) The resource relations of which the company is a part are documented. The specific environmental issues which may be raised relate to the circulation of resources. Thus, the case studies report on the resources base, throughput of resources, and kinds of resources transformations that are made by the company in accordance with the scheme outlined in figure 1 above.

(e) Specific reporting practices in each company are reported as well as comments from management on the need for information and expectations for changes in the future.

30. Using the brief model format as introduced in figure 1, the six cases can be outlined as in figure 2 (in 6 parts, 2.1 to 2.6) below. The specific structure of the six companies as economizing and circulating systems is described. Values in the right hand side of the figures are listed in alphabetical order.

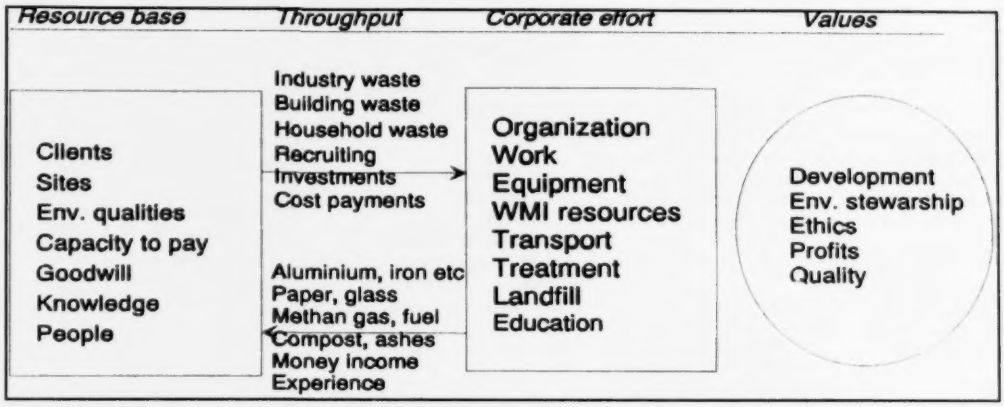

Figure 2.1. WMI Sellbergs. The model has few details, thus giving a brief picture of the circulation of resources of which the company is a part.

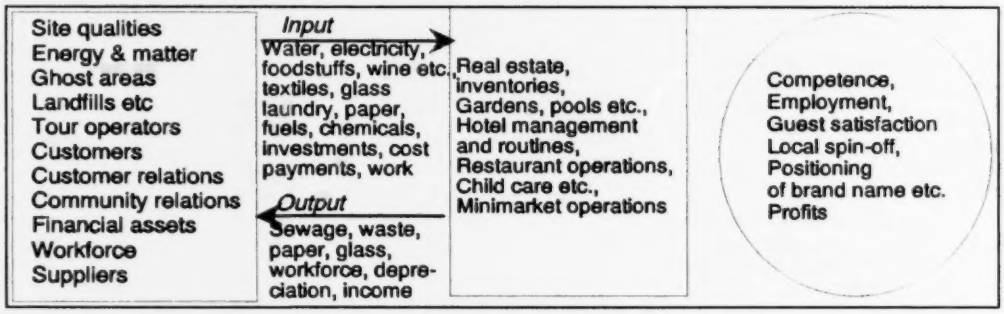
Site qualities
Energy & matter
Ghost areas
Landfills etc
Tour operators
Customers
Customer relations
Community relations
Financial assets
Workforce
Suppliers
Input
Water, electricity, foodstuffs, wine etc., textiles, glass laundry, paper, fuels, chemicals, investments, cost payments, work
Output
Sewage, waste, paper, glass, workforce, depreciation, income
Real estate, inventories, Gardens, pools etc., Hotel management and routines, Restaurant operations, Child care etc., Minimarket operations
Competence, Employment, Guest satisfaction Local spin-off, Positioning of brand name etc. Profits

Figure2.2. Sunwing Hotels. This model gives a much more detailed idea of what is done out of what in the hotel ventures.

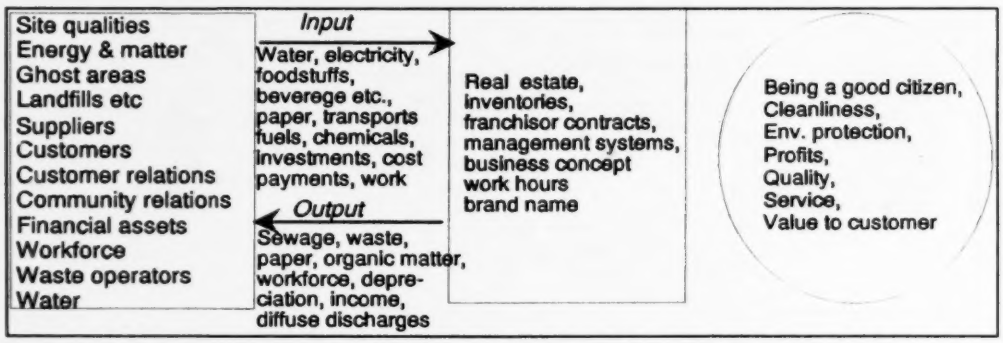
Site qualities
Energy & matter
Ghost areas
Landfills etc
Suppliers
Customers
Customer relations
Community relations
Financial assets
Workforce
Waste operators
Water
Input
Water, electricity, foodstuffs, beverege etc., paper, transports fuels, chemicals, investments, cost payments, work
Output
Sewage, waste, paper, organic matter, workforce, depreciation, income, diffuse discharges
Real estate, inventories, franchisor contracts, management systems, business concept work hours brand name
Being a good citizen, Cleanliness, Env. protection, Profits, Quality, Service, Value to customer

Figure 2.3. Svenska McDonald's. The degree of detail is similar to that of figure 2.2. The value markers, to the right in the figure, are a composite of general group policies and opinions of the Swedish management.

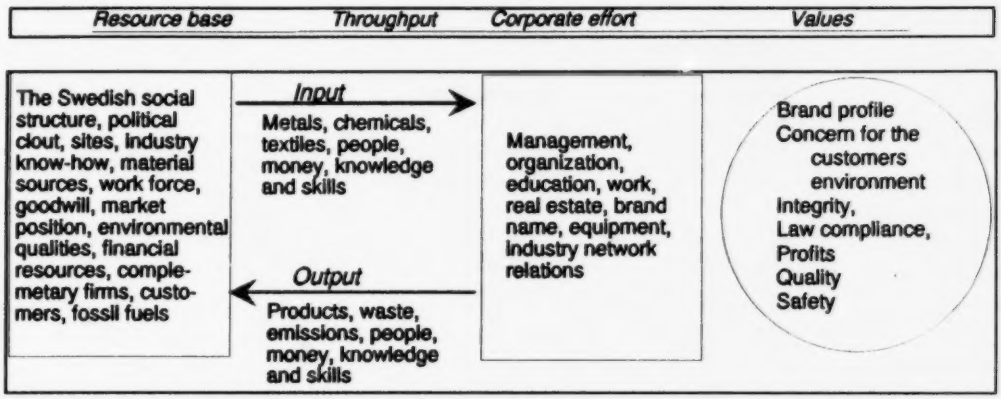
Resource base
Throughput
Corporate effort
Values
The Swedish social structure, political clout, sites, industry know-how, material sources, work force, goodwill, market position, environmental qualities, financial resources, complemetary firms, customers, fossil fuels
Input
Metals, chemicals, textiles, people, money, knowledge and skills
Output
Products, waste, emissions, people, money, knowledge and skills
Management, organization, education, work, real estate, brand name, equipment, industry network relations
Brand profile
Concern for the customers environment
Integrity,
Law compliance,
Profits
Quality
Safety

Figure 2.4. AB Volvo. Here the general dynamics of the company is mapped in a relatively abstract way, while the resource base is indicated in some more detail.

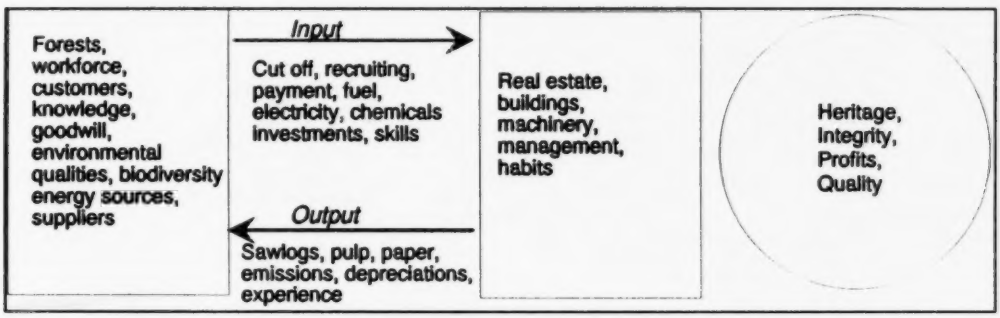

Figure 2.5. STORA Skog. This model, in its content and structure, is close to the general model structure as given in figure 1, above.

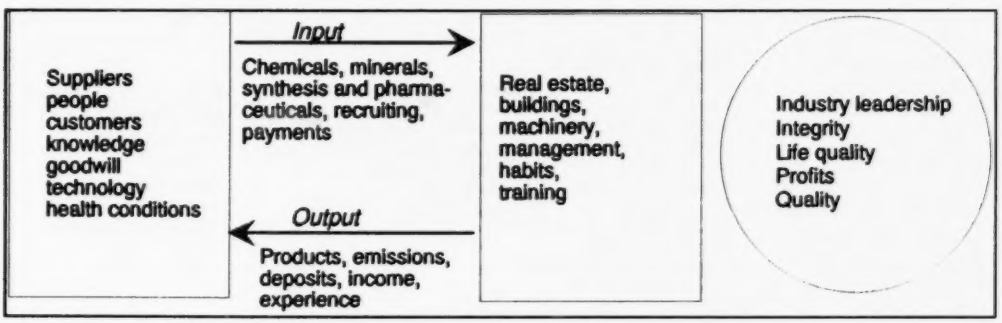

Figure 2.6. ASTRA. See comments to figure 2.5.

V. REPORT DISCLOSURES FOUND IN THE CASE STUDIES

31. This section is a brief overview of current reporting practices in the case study companies. The text is not intended as an assessment of the existing practices. It should rather be read as a factual record. It is not, however, a standardized record for each of the corporations studied but rather it

illustrates where good information is available.

32. As indicated above, if these companies are integrated into transnational groups, they are exposed to the financial markets and generally have greater flexibility with regard to operations sites, and consequently are not expected to develop innovative practices regarding environmental reporting. Table 1 below summarizes the environmental reporting information that was identified in the six case studies. Additional descriptions of the information are included in the documentation of the individual case studies.

Table 1: A brief overview of reporting practices in the case studies

Question	*Response*
Are environmental issues a general management responsibility (distributed down the line)?	Yes, the issues are always acknowledged as such. With varying degrees of explicitness, Group management expects subsidiary units to take proper initiatives for the environment. Reporting and quality assurance are, however, handled by specialized units of staff.
Are environmental issues reported to the Chief Executive Officer and the Board on a regular basis?	Not always on a regular basis and not always identified as environmentally relevant. A fair answer is "most often".
Are there any safeguards against incorrect internal thinking about environmental conditions?	It does happen, but it does not seem to be the normal case. External auditors, external dissemination of information and certification schemes are in use or at least intensively discussed.
Are environmental conditions disclosed in information that is provided to the general public?	Only at a low level of information quality: policies and cost estimations occur alongside physical variables. But there is no environmental performance reporting.
Are environmental conditions integrated into general performance reporting?	No, but within some of the companies there is currently a discussion going on over the issue.

A. The environment and general management

33. At Waste Management International Sellbergs AB (abbreviated as WMIS in this report) all line managers and certain designated individuals have full responsibility for environmental as well as other matters within limits set by the line organization. The line managers also operate a computerized environmental compliance assurance system. A special national staff unit is responsible for interpreting government regulations and relevant scientific knowledge. Educational programmes are developed by the personnel department.

34. At ASTRA, key figures concerning data on significant environmental impacts are reported on a regular basis at each unit. These figures monitor the levels stated in government concessions and regulations as well as in internal goals set up at each specific unit. The frequency of reporting depends on the level of importance of the data from an environmental impact point of view, as well as the ability of the data to be measured in an accurate manner. At one site five to

six different figures are being monitored on a daily basis with regards to both usage and discharge of heavy metals, solvents and chlorine.

35. Within the McDonald's Group, all performance reporting follows a worldwide standard. Reports cover traditional financial statements such as the profit or loss from operations, gross profit and return on investment, and some other performance indicators such as the number of guests, sales per guest, cost of food as a percentage of total costs, etc. This information is supplemented with figures on deliveries of bread-buns, french fries, etc. A goal of 90 per cent waste reduction is measured once every year by an inventory procedure. No external environmental auditor is engaged.

36. Regarding the qualitative goals which restaurants in the world aspire, there is no reporting from Sweden to McDonald's Corporation by traditional means. In the future, however, a number of key ratios will be developed and reported in order to demonstrate compliance with the company's environmental goals. This year, a key ratio regarding the usage of polyethylene plastic will be put in use. The ratio will make it possible to understand and direct the flows of recycled materials. Concerning distribution, besides actual costs, kilometres per ton distributed (outgoing transportation) is used as a key ratio.

37. Each Sunwing hotel has a number of standard financial and operational ratios that are used as guidelines. Such ratios are: the number of occupied beds and rooms, average number of employees, and total revenues per guest-night. Every week each hotel reports their liquidity (cash balance) and results of operations before taxes to the head office in Stockholm. On a monthly basis a profit or loss statement, a balance sheet, a statement of cash flows and the above-mentioned financial and operational ratios are also reported. All reports are entered on forms and sent to Stockholm by mail or by facsimile. Sunwing hotels further report to Group headquarters with the same frequency and the same content. No information goes the opposite way, i.e. from Group headquarters (Airtours) to the head office of Sunwing hotels and back to the individual hotels. However, feed-back is given when divergence from planned budgets occurs.

38. It is customary in the hotel business to record a ratio of the quantity of water and electricity consumed (with the number of guests as the denominator) and this has been done for many years in order to keep costs at a low level. This is, however, not regarded as environmental reporting and it is not reported to the Stockholm head office.

39. Volvo has developed a life-cycle analysis (LCA) system called EPS (Environmental Priority Strategies in product design). EPS helps the Volvo companies to examine the environmental impact of materials and products. Volvo also has an environmental data base, MOTIV, which contains information on more than 5,000 chemical products. A central group in Volvo, called Yrkeshygien (Work environment hygiene), supports the system and evaluates new chemicals. The data base can, for example, be used to find all products that contain a certain chemical. This can be of help in an emergency situation.

40. Volvo's current environmental policy pledges:

(a) to develop and market products with superior environmental properties and which meet the highest efficiency requirements;

(b) to use manufacturing processes that have the least possible impact on the environment;

(c) to actively participate in and conduct research and development activities in the environmental field;

(d) to select environmentally compatible and recyclable material in connection with the development and manufacturing of their products, and when they purchase components from their suppliers;

(e) to apply a total view regarding the adverse impact of products on the environment; and

(f) to strive to attain a uniform, worldwide environmental standard for processes and products.

41. Every company manager is responsible for implementing actions consistent with the above policies. The policy in itself is, however, a centralized product. Volvo's Environmental Council has the final responsibility for the policies. The Council is comprised of specialists from the Group's head office and from the various operating units, and the organization is responsible for the ongoing coordination of activities. In a new version of the policies, suppliers doing business with Volvo must also comply with the above environmental requirements.

B. Environmental audits and internal environmental reports

42. In WMIS the national environmental audit unit is separate from the line units. The audit unit reports directly to WMIS Group headquarters. Special measures safeguard the integrity of the unit from all of the other operating units. The National Environmental Audit Unit maintains a compliance verification system, a database covering all contracts, rules, and claims, etc., which may affect what is the proper thing to do in specific situations. The audit unit assess managerial and auditing procedures used by the units and sets internationally valid standards.

43. The environmental auditing at ASTRA is primarily conducted by the company's own personnel visiting the different units. However at ASTRA's units in Södertälje, auditing is done by an external auditor. Internal environmental reports are presented to the Board of Directors whenever any changes in production takes place -- otherwise the Board receives no formal environmental reports on a regular basis other than the corporation's annual reports.

44. The environmental auditors at Volvo are in-house specialists supervised by the Group's environmental auditor. Auditors need to have access to all accounting and other records with nothing hidden, which is the main reason why external consultants are not used. Still, the auditors always come from units outside of the unit being reviewed. Only on rare occasions have the auditors been from outside Volvo, and this happens solely when special legal knowledge is needed.

45. The audit focuses on different levels of environmental issues:

(a) Compliance with current national legislation;
(b) Compliance with probable future legislation; and
(c) How the Volvo environmental policy objectives have been translated into action plans and concrete measures in the company.

46. The environmental auditors do not perform an annual audit. They rely on a surprise audit to get a maximum reading on policy compliance. The audit is more of an evaluation than a traditional audit in the financial sense. The environmental audit does not give any answers as to how the company should improve its environmental programme: the auditors only point out where poor environmental performance was found. It is the appropriate company manager's responsibility to take suitable measures.

C. Disclosure of environmental information, external certification and other matters

47. A discussion of external certification and environmental auditing is on the agenda at STORA Skog. The Chief Executive Officer has stressed the importance of enjoying public confidence in how forest industries are managed in general, and especially from an environmental point of view. Today STORA Skog has no external environmental auditing. Third party certification is not so much about just attesting to the final product as it is to get a neutral third party's view of the complete operating cycle, from the trees in the forest to the final output.

48. An environmental audit report was included in the 1993 ASTRA annual report.

Starting in 1994 it will be presented as a separate annual report.

49. WMX Technologies Group, the parent company of WMIS, publishes an annual environmental report. It covers all subsidiaries and is a well-written record which shows important changes in capacities, procedures and conditions of environmental relevance. Very little is said about actual performance except in the regulations compliance part, where the following statement appears:

(a) Percentage of areas audited where no significant compliance issues were found;
(b) Percentage of issues resolved according to schedule;
(c) Percentage of penalties which were from self-reported incidents; and,
(d) A compliance index which relates federal penalties to gross revenues.

50. An independent consultant, Arthur D. Little Inc., performs an external audit which covers policies and procedures, organization, training programmes, regulatory and management reporting systems, performance incentives and disciplinary action programmes, regulatory surveillance systems, audit programmes and corrective action systems, and other environmental management programmes and systems in place throughout the company and its subsidiaries.

D. Integration of environmental and financial performance measures

51. There is no reference to traditional business performance measures in the annual environmental report of WMIS (WMX Technologies). Environmental concern is treated as an important corporate item although separate from general business considerations. The management at WMIS emphasizes that integration of financial and environmental measures will be needed in the management processes, but they lack a valid way to construct such measures.

52. At ASTRA key figures of environmental significance are not related to financial factors -- i.e. there is no integrated environmental and financial reporting. The management does not foresee any such immediate integration even though they have access to a sophisticated data base.

53. The question of how to integrate financial and environmental reporting is differently stated at STORA Skog. This integration is a difficult and urgent question for a forestry company. The value of the forest stock is one of the important figures in the general financial report. This stock has a book value but the real value is to be found in the ecological conditions in the forests themselves. In the near future there will be an increasing need for standardized, reliable and confident methods for integrating environmental information with established financial information.

54. McDonald's is, at least for the Swedish operations, approaching a "cyclical society policy". This implies that all operations should be made in accordance with the following four basic principles:

(a) Minimal usage of underground mineral deposits (including fossil fuels);
(b) Artificial compounds should not be used;
(c) The physical conditions of the eco-system must be preserved; and
(d) The energy usage (metabolism) of society must be reduced equitably.

55. There is obviously some way to go before these requirements are fulfilled. Svenska McDonald's in the future will probably include three kinds of capital in their performance reports, which they preliminarily call "financial, natural and human capital", in order to keep track of the direction which they have decided to follow.

VI. THE POTENTIAL FOR INTEGRATING BUSINESS AND ENVIRONMENTAL PERFORMANCE INFORMATION

A. Potential for developing environmental reports in monetary terms

56. As indicated earlier in the report there are various ways to integrate notions of environmental performance into general business performance concepts. Several studies focusing on general industry statistics and similar topics employ add-on strategies where traditional financial accounting is given. However, no practical managerial applications of such a methodology were found in the literature when conducting the research for this report. It might seem that there are limited prospects for developing environmental reports for managerial use in monetary terms. Still, the approach is in high esteem in academic and political institutions.

B. Potential for developing holistic performance indexes

57. Another alternative is Life Cycle Analysis. This technique maps all environmental relationships of a product or a process when all of its components are traced back to their natural beginnings, called the "cradle", and all applications are traced forward to their ultimate dispositions, called their "graves". It is an engineering approach in which the aim is to minimize harmful environmental outcomes. The user of LCA has to face delicate valuational decisions since various effects must be combined. How, for example, do you evaluate shorter transport distances against greater sewage volumes?

58. A radical development of the technique has been done for the Swedish car industry, called the EPS system (Ryding and Steen 1991). This is described in the case for Volvo. By means of standard procedures, an "environmental index" can be computed for every part in a construction (or production) process. The indexes of all the parts are then multiplied to produce a compound index for the whole process. To standardize the results, all health outcomes are related to a single individual and all ecological outcomes are related to a single square kilometer.

59. The EPS approach is rough and it has been criticized for its superficial way of handling value questions. Its merit is that it produces a specific number, which can work as a benchmark for further and more specific investigations of environmental outcomes. Probably a lot of environmental improvements never come about because there is no specific place on where to start. If such an abstract index as EPS measures should be built into managerial control systems, the opposite effect is likely to occur. Managers will not have ways to go beyond the numbers -- only experts can tell what questions to ask. The importance of performance indicators can be concrete and intelligible to those using them. According to Johnson & Kaplan (1987) this is exactly the reason behind the current dominance of financial indicators in corporate decision making.

60. Index methods are sparse outside engineering practices. One exception may be rating models as those used by, for example, Standard & Poor's and Moody's. Standard & Poor's describe their model in this way:

> "Typically, analyses are based on five years of historical results and projected data ranging from two to three years. Projections are important for discussing the firm's planning process, future direction, and management philosophy. They are not intended to be used to judge management's forecasting ability.
>
> Ratings compare risks among debt issuers, with relative ranking taking place on several levels. Issuers in the same industry are compared on both a domestic and international basis. S&P's analytical approach is designed to produce a cross-border yardstick of comparison.
>
> Specific weights are not assigned to any of the rating criteria. The

rating finally assigned is a synthesis of qualitative and quantitative factors discussed within a committee on a case-by-case basis.

S&P's analytical framework for corporate issuers is comprised of two key components. The first is oriented towards business or competitive analysis; the second is related to financial analysis. ..." (Standard & Poor's, 1992)

61. In the presentation of their rating criteria Standard & Poor's underlines that the rating process is not limited to an examination of various financial measures. On the contrary, a proper assessment of debt protection levels requires a broader perspective involving business fundamentals. They do not explicitly point to environmental conditions as being part of those business fundamentals, although nothing is said about keeping such considerations out.

62. It is likely that the environmental conditions for a corporation are growing in importance when conducting a rating. The very concealed nature of the process where only the outcome, the rating, is disclosed leads to speculation. Rating companies claiming they make explicit environmentally- based judgments have appeared on the market recently. This may force a more general recognition of environmental concern as being an integral part of business management.

C. Potential for refining the structure of performance information

63. Among the reported case studies, this strategy is discussed at least within two of the case study companies, Svenska McDonald's and STORA Skog. In the future, Svenska McDonald's will probably include "financial, natural and human capital" in their performance reports. To do that in a practical way they will have to adopt an economic model of the company where the capital concept is open for this kind of extended use. The basic scheme used in the case studies illustrates exactly that: since the company is circulating all kinds of resources (financial, natural/material, and human/social) and acts as an economizing unit, it seems to be a good thing not to confuse the various kinds of resources with each other.

64. The experiences from research and practical developments in Swedish municipalities underline the same thing: a site-conscious (and/or quality-conscious) management system is dependant upon economic concepts where all kinds of resources and all kinds of qualities are rigorously treated. Basically, being "economical" is to consider how means are used to meet ends. Therefore, management should consider how to use scarce resources for attaining explicit goals, which implies claims for effectiveness, claims for thrift, and claims for good margins and low risk financially as well as for outside aspects of ventures.

65. In Sweden a new kind of accounting system has been developed and tested that intends to be directly derived from sustainable development visions and strategies. Performance measurement is tied to the concepts presented above: effectiveness, thrift and margin. The approach is called SDR (sustainable development records). Various general conditions restricting the approach are presented elsewhere (Daly 1977, Bergström 1992, 1993, 1995). The general SDR model structure, which is the one used in the case studies for this report (see figure 1), is mapped into an accounting scheme where the stock data end up in a balance sheet and change-process data in a profit-and-loss account.

66. From an environmental point of view the SDR approach differs from most other approaches in not establishing separate environmental accounts. The idea is to develop measures for general strategic performance assessment in a way which facilitates concern about the environment. The problem addressed with SDR is not the problem of giving the environment due attention but to stop treating the environment as something peculiar, where "normal" ways of being rational do not apply.

67. SDR is thus an accounting approach to sustainable development. It is

currently being tried out in several Swedish municipalities, state agencies and companies. The basis of SDR theory is that every operation is defined by its ecological conditions and these conditions are as intelligible as a business firm. From a business firm you expect financial results, cost controls and accountability. SDR is thus focused on how to organize information on essential results from enterprise efforts. Technically the method is built upon a rigorous implementation of double entry accounting in real terms, i.e. the entries do not have to be made in monetary measures.

68. SDR theory is built on a combination of three sets of logic with roots in the fields of ecology, economy and accounting.

(a) The ecological logic or the scheme of accounts and other descriptive concepts are built on the physical transformation process of the business;

(b) The economical logic whereby:

(i) Explicit value criteria are added to the circulation model. This is the foundation for tracking revenue concepts.

(ii) The essence of economic analysis is a non-violence principle, meaning that one should never use more effort than needed to reach a specific target.

(c) The accounting logic whereby:

(i) Double entry accounting means that every transaction is done both at the source and at the destination. In that way detailed records are kept of the throughput generated by the business.

(ii) Balance sheets (there is one for every kind of measure used) and income statements show a clear distinction between asset levels and positional measures on the one hand and throughput and change measures on the other.

(iii) When the books are closed debits and credits must equal, which makes it possible to audit the system systematically. Because of this one would be willing to handle very complex information which otherwise would break the system down.

69. The SDR approach is focused on managerial accounting and control systems. Experience so far shows some benefits with the system: first, the system development process has worked as a vehicle for making strategic thinking more explicit; second, the combination of real measures and explicit performance criteria gives room for quantitative following up where only personal subjective judgment was articulated before. Important qualities (technical qualities, environmental qualities, customer qualities, etc.) are handled in the same way, and with the same rigor as financial data. Third, sub-parts of a business as well as development over time are made comparable. Fourth, when discussing sustainable development the SDR approach can measure "small steps in the right direction" even if those steps are taken at a very low level. Results measures in the SDR system are mostly of a key indicator type, as illustrated in table 2 above. All key indicators are designed to give a higher number for a better state of the system.

Table 2: Possible key indicators of the SDR type. The examples refer to the case studies and correspond to the models in figure 2, above. It should be noted that these key indicators are presented here for illustrative reasons only. They are not sanctioned by the management of the enterprises in the case studies

	Effectiveness = A value indicator/a corporate effort indicator	**Thrift =** A corporate effort indicator/a throughput indicator	**Margin =** A throughput indicator/a resource base indicator [1]
(WMI Sellbergs)	Profits/WMI Resources employed	Salable matter/ total throughput of matter	Liquid assets/cost turnaround
(Sunwing hotels)	Customer satisfaction /real estate value	Number of guests/laundry	Local workforce/employees
(Svenska McDonald's)	Profits/capital employed	Capital/transport volume	Recycled waste/material input
(Volvo)	Brand position/cars sold	Cars produced/emissions from factories	Critical emission/current emission
(STORA Skog)	Market share in highest price segment	Sales/transport volumes	Organic growth/cutoff
(ASTRA)	Market share for the main product line	Sales/marketing effort	Patents/distributed profits

VII. CONCLUSIONS

A. Differences between industries

70. Some of the arguments around the general conditions for an enterprise to develop practical environmental awareness are summarized in table 3 below, where the "state of advantage" column summarizes those conditions which would make advanced and ambitious approaches to the integration of business and environmental performance measures likely.

Table 3. Conditions for an enterprise to develop a practical environmental awareness

Type of condition	*State of advantage*	*State of disadvantage*
Site dependency	Clear and understood	Confused or unknown
Exposure to financial markets	Low	High
Formal integrity	High	Low
Abstract vs. material operations	Material	Abstract
Customer claims	Quality conscious	Diffuse, price conscious

71. From these classifications it can be concluded that the cases chosen for this report exist in a middle ground between the advantage and the disadvantage states for developing new practices around financial and environmental reporting.

B. Importance of market and legislative contexts

72. Environmental costs to enterprises are a function of time to adapt. Tough political measures in combination with early warnings before the needed changes actually occur seem to be a successful political strategy for influencing companies with mainly reactive and passive ways to handle environmental and developmental issues.

73. It appears that transnational corporations typically need firm legislation before they will develop sustainable practices. This is partly because enterprise managements feel that the internalization of environmental costs in their costs of production will reduce the profitability of their products and make them uncompetitive in the market place and will have an adverse impact on the profitability of the enterprises. At the same time TNCs can usually avoid strong legislation because of their international flexibility in locating production facilities. However, this flexibility should not be over emphasized since investments are made somewhere in the world and economic considerations such as transporation costs and costs or relocation could significantly affect the profitability of operations.

74. State agencies and local municipalities should not under estimate their power as buying agents. Where a unified policy concerning environmental standards is possible, these bodies constitute a considerable market for many industries. An illustrative case was the development of low-chlorine/chlorine-free paper in Sweden.

75. It has been found that companies with an ambition to have a more sustainable development become increasingly involved with non-governmental organizations (NGOs). STORA Skog has good forestry management and social reasons to make their production more adapted to ecological sustainability. Partly, this can only be accomplished at a cost which their markets will accept only if environmental NGOs push both their competitors and their customers in the same direction. The legitimacy of NGOs as agents capable of raising "necessary" claims is thus an important asset for companies with advanced environmental concepts.

76. EMAS and similar initiatives will work both as a stimulus and as an impediment to a sustainable development. On the one hand such programmes initiate action where environmental initiatives otherwise probably would be delayed. On the other hand it is expected that conservative business practices and the slowness of change will be consolidated and institutionalized.

C. What may and may not be accomplished in the future

77. The point about EMAS mentioned above illustrates a general condition worth further mention. Some methods and practices may be successful in introducing the environment on to the business agenda but at the same time the actions taken may be obstacles for going beyond a first step. It takes confidence to initiate an action programme. Those trying to take a first step in raising environmental concern may find a given action most valuable, while the same action may be criticized by others as being an impediment to going further. The context within which environmental and financial performance is integrated differ considerably.

78. Items which need to be dealt with in the future may include the following:

(a) Cost/benefit analysis, full cost accounting and similar methods aimed at representing environmental relations in monetary terms rest on methodological assumptions which are still evolving;

(b) Environmental reports which are not related either to enterprise policies or performance open up the field and give some discretion to employees with interest in the issues. These iniatives, whenever appropriate, should be integrated with management responsibilities to capitalize on and encourage employee participation;

(c) Heavy dependence on experts in decision-making bodies for interpreting

the information given is a consequence of abstract figures and long chains of derivation. Greater efforts are required to ensure that the information is presented to decision-makers in a user-friendly manner;

(d) Governmental bodies, international regulation and other policies provide many options for action. Table 4 describes the lines of public action which would support activities of enterprises whose management styles have different characteristics and goals;

(e) When sustainable development and environmental considerations become the central concern of management it is possible that values which earlier were taken as given may need to be reassessed; and,

(f) On the one hand some enterprises may introduce the kind of "revolutionary" processes which will follow their acknowledgment of broad environmental issues. Alternatively, other enterprises may be tempted to use inexpensive investigations, a low profile and a compliance strategy while others make the investments. The most suitable approach has yet to be defined.

79. Among the progressive routes, the following are emphasized:

(a) Authorities and the research community can help enterprises that exhibit motivation on their own to develop new ways to integrate various kinds of performance information. Standards for external disclosure will be successful if they build upon principles and techniques which have worked well in internal management systems;

(b) Generally, it seems that structural approaches, especially the broadening of basic economic concepts, are more open-ended and thus innovative than the alternatives. Such strategies should not, however, be expected to be quickly adopted in transnational corporations generally. Those with well-recognized site and resource problems to handle are expected to set the pace;

(c) Generally, government policies would benefit from a more flexible attitude to management realities in TNCs. Table 4 above summarizes observations and conclusions made in this report showing a wide assortment of possible public actions that would support the integration of environmental considerations into corporate performance concepts, whether performance measures are publicly disclosed or not. The general format of the scheme, as well as many of the specific points in the table, are taken from the Benchmark Corporate Environmental Survey. (United Nations, 1993, p.168).

Table 4. The relationship of types of enterprise managements to their operating activities and to governmental actions which support those activities

Management type	Enterprise activities	Supporting governmental activities
I. Compliance-oriented management *(The reactive enterprise)*	End-of pipe solutions Abatement procedures Compliance reports Environmental experts in staff unit Emergency response	Command and control, realistic regulation Dialogue with industry organizations, conferences etc. Inform on regulations, early attention Tough enforcement
II. Preventive management *(The lean and precautionary enterprise)*	Internal audits Pollution prevention Waste minimization Public information Green accounting Line management responsibility for environmental issues.	Increased liabilities Waste treatment requirements, restrictive landfills policies, etc. Community right-to-know claims Energy conservation programmes, demand side management Green tax schemes
III. Strategic environmental management *(The concept seeking enterprise)*	Public dialogue, environmental product positioning External audits and use of environmental certification programmes Disclosure of quantitative throughput information; extensive LCA programmes Integration of environment, health and safety into technical design, "green" R&D	Stable regulatory build-up Green labeling programmes Support of consumer and green investor initiatives Strategic buying projects within public bodies Build-up of local and regional bodies for focusing joint industrial - public throughput issues
IV. Sustainable development management *(The responsive enterprise)*	Acknowledging of the enterprise's role in international wealth distribution Acknowledging of the enterprise's role in throughput of matter and energy Policies for ethical sales, climate change, throughput thrift etc. Use of best practice in all operations internationally. Sustainable development fully integrated into enterprise performance reporting. International auditing.	International information dissemination International harmonization of environmental regulation, standards and taxation. Health, safety and sustainable development is prioritized before traditional free trade values in international negotiations.

References

Andrews, P.W.S., 1949, Manufacturing Business. London: MacMillan.

Bateson, G., 1972, Steps to an Ecology of Mind. New York: Ballantine Books.

Bergström, S., 1992, "Ecology, Economy and Value Theory." In Human Responsibility and Global Change, ed. by L.O. Hansson and B. Jungen. Heidelberg: Springer.

Bergström, S., 1993, "Value Standards in Sub-Sustainable Development. On Limits to Ecological Economics." Ecological Economics 7:1 pp. 1-18.

Bergström, S., 1995, Sustainable Management. On Discretion between Endowment and Quality. New York: Island Press (forthcoming).

Björsell, M., 1993, Environmental Expenditures in the Swedish Manufacturing Industries. Stockholm: Statistics Sweden/Env. Statistics Programme. August 1993.

Buzzel, R.D., and B.T. Gale, 1987, The PIMS Principles - Linking Strategy to Performance. New York: The Free Press.

Chandler Jr., A.D., 1977, The Visible Hand, Cambridge, Mass.: Harvard University Press.

Common, M., 1988, "Poverty and Progress Revisited". In Economics, Growth and Sustainable Environments. David Collard et al (eds.), London: Macmillan, pp. 15-39.

Cook, E., 1976, Man, Energy, Society, San Francisco: Freeman.

Cyert, R., and J. March, 1963, A Behavioral Theory of the Firm. Englewood Cliffs, N.J.: McGraw-Hill.

Daly, H., 1977, Steady State Economics, San Francisco: Freeman.

Douglas, M., 1986, How Institutions Think. Syracuse, N.Y.: Syracuse University Press.

Drucker, P.F., 1993, Post-Capitalist Society, New York: Harper Business.

Earl, P., 1983, The Economic Imagination, New York: Sharpe.

Eisner, R., 1988, "Extended Accounts for National Income and Product", Journal of Economic Literature, Vol. XXVI (Dec. 1988) pp. 1611-1684.

Harris, M., 1977, Cannibals and Kings: The Origins of Culture, New York: Random House.

Johnson, H.T., and R.S. Kaplan, 1987, Relevance Lost: The Rise and Fall of Managerial Accounting. Cambridge, Mass.: Harvard University Press.

Lovelock, J.E., 1982, Gaia, a New Look at Life on Earth, New York and Toronto: Oxford University Press.

Miller, J.G., 1978, Living Systems, New York: McGraw-Hill.

Myrdal, G., 1975, Against the Stream, New York: Vintage Books.

Nordhaus, W., and Tobin, 1973, "Is Growth Obsolete?", in The Measurement of Economic and Social Performance, ed. by M. Moss. New York: National Bureau of Economic Research.

Prigogine, I., and I. Stengers, 1984, Order Out of Chaos: Man's New Dialogue with Nature, New York: Bantam Books.

Ryding, S-O., and B. Steen, 1991, EPS-systemet, IVL, Göteborg, B 1022.

Standard & Poor's, 1992, International Criteria. New York (June).

United Nations, 1990, Information Disclosure Relating to Environmental Measures, New York: United Nations.

United Nations, 1991, Accounting for Environmental Protection Measures, New York: United Nations.

United Nations, 1992, Environmental Disclosures: International Survey of Corporate Reporting Practices, New York: United Nations.

United Nations, 1993, Environmental Management in Transnational Corporations. Report on the Benchmark Corporate Environmental Survey. New York: United Nations.

United Nations, 1993, Case Study in Accounting for Sustainable Forestry Management, New York: United Nations.

Vester, F., 1988, Leitmotiv vernetztes Denken. Für einen besseren Umgang mit der Welt , Munich: Wilhelm Heyne Verlag.

Welford, R., and A. Gouldson, 1993, Environmental Management and Business Strategy, London: Pitman Publishing.

Young, M.D., 1992, Sustainable Investment and Resource Use, The Parthenon Publishing Group, London: UNESCO: Man and the Biosphere series, vol.9.

Zolotas, X., 1981, Economic Growth and Declining Social Welfare, Athens: Bank of Greece.

[1] Technically, the format of margin measures varies, depending on different structures in resource bases.